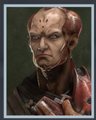
3dtotal.com

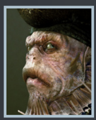
3dcreative

Issue 052 December 2009



Interview
Cédric Séaut

The Gallery
Michal Kwolek, Rebeca Puebla, Sven Juhlin & more!



Project Overview
"Pirate Hype"
by Pao (Thitipong Jitmakusol)

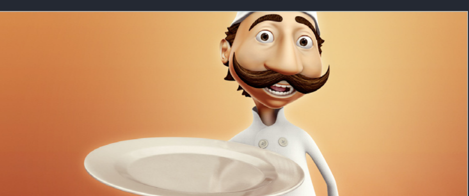
FREE – Inside Look!
Digital Art Masters: Volume 4 Project Overview by Bruno Melo de Souza

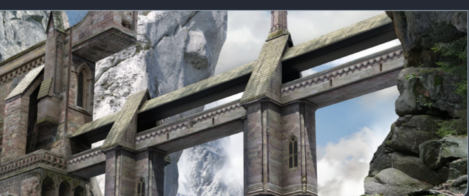
DOWNLOAD RESOURCES

- Free Low Poly Next Gen Character Model & Textures

THE LIGHTING ISSUE

V-Ray: Global Illumination with Eric Ennis; modeling & lighting a scene with Richard Tilbury; and setting up lighting rigs in our Next Gen character series!





Next-Gen Character Creation
Joseph Harford, **Gavin Goulden**, **James Busby** & **John Hayes** show us how to apply materials, set up our **lighting** rig, and render in this final chapter

Photoshop for 3D
Fabio M. Ragonha teaches us the importance of creating a good backdrop for a character, which is both complimentary and serves to enhance them

NEW!! V-Ray for 3ds Max
In the first chapter of our **new** tutorial series dedicated the V-Ray renderer, **Eric Ennis** talks to us about **Global Illumination**

Creating a Fantasy Scene
In the second chapter of this tutorial series, **Richard Tilbury** gives us a general overview of modeling and **lighting** his 3D fantasy environment

Editorial

Welcome to the last issue of 2009, where we wrap up two of our tutorial series' and get you ready for a fresh start in 2010!

We'll be tackling the final chapter of the **Next Gen** tutorial series with **Joseph Harford** for Max, **Gavin Goulden** for Maya, **James Busby** for LightWave, and **John Hayes** for modo, where we'll be setting up our shaders and materials, and applying textures; moving on to set up a light rig and camera, and finishing with a final render. Each artist also finishes his chapter with a preview of what the character would look like in-game, so turn to P.88 to get your final fix of that Next Gen tutorial good stuff! And for those wondering what's coming next month, to follow on from such a fantastic tutorial series, well here's your answer: Due to popular demand we'll be bringing you a second series of Environment Lighting, this time looking at an outdoor environment, specifically created to make it the ideal demo model for the lighting scenarios we'll be teaching you. This series will come to you for Max and Mental Ray, Max and V-Ray, Maya, and Cinema 4D. We have a great artist line-up planned for you, and we're even working on a third series of Environment Lighting tutorials as well, so you'll want to stay tuned to 3DCreative in 2010 – that's a heads up from me to you!

We'll also be finishing up with the final chapter of our **Photoshop for 3D** tutorial series, with **Fabio M. Raghona** teaching us how to create backgrounds for characters. Fabio has very kindly donated two of his stunning character renders to the mix, showing us how to efficiently render out passes to test colors and settings in the post-production stage. Moving on, Fabio will then take us through the creation of a simple but effective background for a full cartoon character – although the techniques can be applied to any kind of character! Check out P.34 for all these post-production tips and techniques.

We welcome back **Richard Tilbury** this month: Richard will be taking us through the second stage of his **Fantasy Scene** creation, modeling and lighting his 3D scene; focusing on volume and key forms to get the perfect perspective and lighting scenario for his concept (P.62). Plus we have yet another brand new tutorial for you – this time: **V-Ray for 3ds Max**! Check out this month's cover to see the scene that our new featured tutorial artist, **Eric Ennis**, will be using to discuss the key parameters of V-Ray. This month: Global Illumination! Check out P.46 for Eric's first installment.

Let's talk interviews now, as this will also lead me rather nicely into a fantastic new feature coming in the January 2010 issue. We **interview** the one and only **Cedric Seaut**, the notorious second place winner of the Dominance War IV competition, and hard surface modeling guru! There's a sneak peek in the interview of the character that Cedric will be modeling for us over six chapters, starting in the next issue of 3DCreative, so check out P.8 now and get yourselves fired up for some organic and hard surface modeling next month – a great start to 2010, if I do say so myself!

To round up the rest of the issue, we have **Thitipong Jitmakusol** – otherwise known as **Pao** – an artist from the award-winning Digital Domain Productions in California, here to bring us the **making of** his interpretation of a sea creature captain, perfectly fit for a scene in the legendary *Pirates of the Caribbean*! See P.72 to learn some tips from this master on how to create a stunning character in a short space of time – prepare to be impressed! And in our **gallery** this month, we see fantastic new creations by **Alexis Van der Haeghe**, **Michal Kwolek**, **Rebeca Puebla** and **Sven Juhlin**, to name just a few of our December line up. So that's another mighty issue of 3DCreative for you. Enjoy! ED.

001 Contents
What's in this month?

008 Cédric Séaut
3D Artist at Ubisoft

020 The Gallery
10 of the Best 3D Artworks

034 Photoshop for 3D
Chapter 6 – Creating Backgrounds for Characters

046 New!! V-Ray for 3ds Max
Chapter 1 – V-Ray: Global Illumination

062 Creating a Fantasy Scene
Chapter 2 – Using 3D, Photography & Post-Production

072 "Pirate Hype"
Project Overview by Pao (Thitipong Jitmakusol)

082 "The Portrait of a Bishop"
Digital Art Masters: Volume 4 – Free Chapter

086 About Us
3DTotal.com Ltd Information & Contacts

088 Next-Gen Character
Series for ZBrush, 3ds Max, LightWave, Maya & modo

Editor
Lynette Clee

Lead Designer
Chris Perrins

Layout
Layla Khani
Matt Lewis

Marketing
Lynette Clee

Content
Lynette Clee
Tom Greenway
Richard Tilbury
Chris Perrins

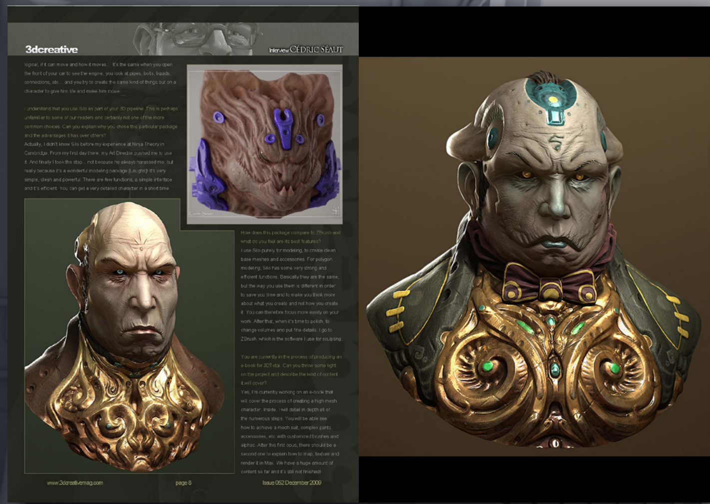
Proofing
Lynette Clee
Jo Hargreaves

Free Stuff!
Wherever you see this symbol, click it to download resources, extras & even movies!

DOWNLOAD RESOURCES

Get the most out of your Magazine!

If you're having problems viewing the double-page spreads that we feature in this magazine, follow this handy little guide on how to set up your PDF reader!



Setting up your PDF reader

For optimum viewing of the magazine, it is recommended that you have the latest Acrobat Reader installed. You can download it for free, here: DOWNLOAD!

To view the many double-page spreads featured in 3DCreative magazine, you can set the reader to display 'two-up', which will show double-page spreads as one large landscape image:

1. Open the magazine in Reader;
2. Go to the VIEW menu, then PAGE DISPLAY;
3. Select TWO-UP CONTINUOUS, making sure that SHOW COVER PAGE is also selected.

That's it!

Contributing Artists

Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in 3DCreative magazine, please contact: lynette@3dtotal.com

Next Gen Character

This tutorial series provides a comprehensive guide through the process of creating a 3D character intended for use within a next-gen console environment. **Joseph Harford, Gavin Goulden, James Busby** and **John Hayes** tackle this series providing versions for 3ds Max, LightWave, Maya, and modo, including ZBrush!

Richard Tilbury

Has had a passion for drawing since being a couple of feet tall. He studied fine art and was eventually led into the realm of computers several years ago. His brushes have slowly been dissolving in white spirit since the late 90s, and now his graphics tablet has become their successor. He still sketches regularly, balancing his time between 2D and 3D.

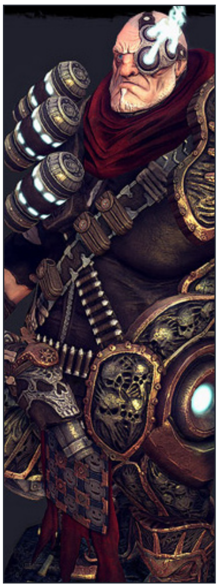
www.richardtilburyart.com | rich@3dtotal.com

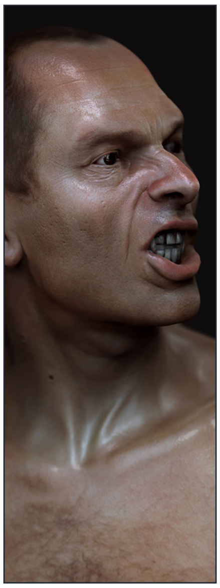
Gavin Goulden

Freelance Character Artist based in Vancouver, BC. Gavin has several years' experience ranging from mobile to next-generation games, and specializes in creating high detailed characters. He has contributed multiple tutorials to the community, and can often be seen posting on game art forums and participating in their community competitions.

www.gavimage.com

gavin@gavimage.com





Joseph Harford

An avid artist since childhood; after freelancing in advertising and film Joe worked in the games industry at Crytek GMBH, the German games company behind *Far Cry* and *Crysis*. He later moved to Ubisoft as a senior character artist, and has since founded ShineLabs, a digital asset and artwork company, where he currently works.

www.josephharford.com

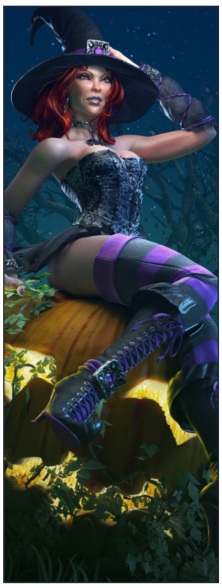
www.shine-labs.com

James Busby

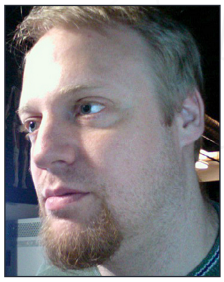
After working in the industry for about seven years on everything from games to television ads, James setup his own Sheffield based company, Ten24.info, in 2008, which provides assets for all sectors of the media. He hopes his version of the next-gen tutorial series will be useful to those wanting to pick up LightWave as a character modeling tool.

www.ten24.info

jamie@ten24.info



John Hayes



Coming from a 2D background, John started in game development in 1996 as a concept artist and character artist. The first few Nintendo games improved his 3D digital skills and techniques for game development. He then joined Capcom as a senior character artist, moving into character lead, followed by his role at Sega as senior character artist and then character art lead.

http://zugok.cgsociety.org | zugok@sbcglobal.net

Fabio M Raghona

From São Paulo, Brazil, Fabio started in 3D five years ago, after working as a web designer in advertising. He currently works for a company creating spots for TV; before which he was working at Seagullsfly.com. Fabio did a stint working freelance, and still currently accepts freelance projects. His area of expertise is character creation and illustration.

www.fabiomr.com
fabioragonha@yahoo.com.br

Eric Ennis

26-year old self-taught digital artist in Paris, France, Eric saw *Tron* as a child and decided then that 3D was the way to go! He began learning LightWave 4, later moving onto 3ds Max 3. He started out in videogames, working for various companies in Paris, and then moved to England to join Realtime UK, before joining BUF Studio in Paris.

www.eric-ennis.com
contact@eric-ennis.com

Pao (Thitipong Jitmakusol)

A multi-skilled artist born in Bangkok, Thailand, Pao grew up in a wholesale paper factory, introducing him to the world of art and creativity. His work has received recognition internationally, and he currently works as a digital artist at the prestigious Digital Domain in Venice, California, where he has worked on titles such as *Pirates of the Caribbean*, *Transformers*, and *G.I. Joe*.

www.iampao.com | iampao@gmail.com

Would You Like to Contribute to 3DCreative or 2DArtist Magazine?

We are always looking for tutorial artists, gallery submissions, potential interviewees, 'making of' writers, and more. For more information, please send a link to your portfolio, or send examples, to: lynette@3dtotal.com

Foothills by Kevin Gauthier


digital-tutors®
Online Training Library
Now Over
9000 Lessons
Discover the Largest CG Training Library Today!
Sign-up for a Trial Pass at www.digitaltutors.com
and get access to 12 all-new FREE courses.
Autodesk® Authorized Publisher
Adobe AUTHORIZED Training Center
HOUDINI TRAINING PARTNER
Certified by Next Limit
Pixologic makers of ZBrush® Authorized Training Provider
PIXAR's RenderMan®
Copyright © 2002-2009 Digital-Tutors, a service of PL Studios, Inc. All logos and trademarks are the properties of their respective owners.


ZBrush 3.5®
"ZBrush 3.5 has allowed artists a remarkable amount of freedom. ZSketch in particular has redefined traditional polygon modeling and made it much more intuitive. I am grateful for the benefits that ZBrush provides"
CGI Artist
Tae-Bong Lim
Pixologic™
makers of ZBrush®
To join our online community visit
www.ZBrushCentral.com
Available now for PC

"Passion is important. Without passion, there's no creation."

Cédric Séaut

Cédric Séaut is a digital sculptor working in the games industry. His introduction into this career came courtesy of Ninja Theory where he worked on their successful title, *Heavenly Sword*. He now works for Ubisoft and has recently attained some notoriety for being awarded second place in the Dominance War IV competition... so we thought it was about time we found out more about him!

Interview with Cédric Séaut

Could you tell us a little about your background and how you came to be involved in the world of 3D?

Since childhood, I've always been fascinated by cinema, Manga and Belgium/French and American comics. I used to spend every free minute reading, drawing (more trying...) and going to the cinema. Computers were quite expensive 12 years ago so I waited until after high school to get some small jobs and be able to finally get one. After high school, I tried to find some 3D schools, but in France it's hard to find one; they are usually bad or just very expensive and so I finally opted for computer programming at university for four years. Unfortunately, I didn't really learn any 3D so I worked hard every evening and weekend. At the same time, I created some mini flash games to pay my rent. One day, after a lot of patience and tests, an amazing guy (Hugues Giboire) gave me my chance in Cambridge on *Heavenly Sword*... it was the beginning of a beautiful adventure!

Heavenly Sword contained some great artwork and concept design, but what was it like working on the project and what were the main things the job taught you?

Heavenly Sword was my first experience of working on a game. And working on characters for a first experience was just the most amazing chance ever. So actually, this game gave me the opportunity to learn everything from concept to in-game character creation. It was also the chance to live in a new country and to meet new people and make new friends.

Character created for an upcoming tutorial series starting in the January 2010 issue of 3DCreative

"I usually ask my wife if she likes them or not. If the answer is yes, I keep going."

You were recently awarded 2nd place in the Dominance War IV competition. Can you describe your inspiration behind the design and how you went about creating such a complex character?

Before doing this character, I didn't really know what to do. I created a sphere in ZBrush and let my hands do the work. It was very bad but I just needed a start. I usually ask my wife if she likes them or not. If the answer is yes, I keep going. I was probably influenced by my current job (James Cameron's *Avatar*, the game) and by some Manga I was reading at the same time, *Gunnm: Last Order* and *Full Metal Alchemist*. Before polishing, I looked for some pictures on the internet for references; the incredible Fausto de Martini, Vitaly Bulgarov and Damien Canderle were the main ones. I'm a huge fan of their work! Then the ZBrush and 3ds Max tools and functions helped me to finish up the rest.

You mention looking at reference pictures with regards to polishing your designs. Can you elaborate on this and explain what it is you look for?

Actually, I used to study patterns, details, colors, overall shape and how everything works, if it's

logical, if it can move and how it moves… It's the same when you open the front of your car to see the engine, you look at pipes, bolts, liquids, connections, etc… and you try to create the same kind of things but on a character to give him life and make him move.

I understand that you use Silo as part of your 3D pipeline. This is perhaps unfamiliar to some of our readers and certainly not one of the more common choices. Can you explain why you chose this particular package and the advantages it has over others?

Actually, I didn't know Silo before my experience at Ninja Theory in Cambridge. From my first day there, my Art Director pushed me to use it. And finally I took the step... not because he always harassed me, but really because it's a wonderful modeling package [Laughs]! It's very simple, clean and powerful. There are few functions, a simple interface and it's efficient. You can get a very detailed character in a short time.

How does this package compare to ZBrush and what do you feel are its best features?

I use Silo purely for modeling, to create clean base meshes and accessories. For polygon modeling, Silo has some very strong and efficient functions. Basically they are the same, but the way you use them is different in order to save you time and to make you think more about what you create and not how you create it. You can therefore focus more easily on your work. After that, when it's time to polish, to change volumes and put fine details, I go to ZBrush, which is the software I use for sculpting.

You are currently in the process of producing an e-book for 3DTotal. Can you throw some light on the project and describe the kind of content it will cover?

Yes, I'm currently working on an e-book that will cover the process of creating a high mesh character. Inside, I will detail in depth all of the numerous steps. You will be able see how to achieve a mech suit, complex pants, accessories, etc. with customized brushes and alphas. After this first opus, there should be a second one to explain how to map, texture and render it in Max. We have a huge amount of content so far and it's still not finished!


IV
DOMINANCE WAR
MASSIVE ART CHALLENGE ONLINE

You have collaborated on a few game titles which appear on your website, but are also available for freelance work. Can you describe your current position and any upcoming work you have in the pipeline?

I'm currently a senior digital sculptor at Ubisoft, working on some characters for games. I'm having a lot of fun so far on a new Ubisoft project in Montpellier and I'm also working on some figurines for 3D print. I'm still open for freelance opportunities.

I see from your portfolio that you have some drawings that relate to some of your 3D models. Is concept work and sketching a common part of your working process and something you feel is important to a 3D modeller?

Unfortunately, I don't draw anymore; the examples on my website are just some old examples. Yes, I still think that drawing is an important step in the creative process, but the current tools, like ZBrush, allow you to come up with 3D concepts and sketches quickly. It's just up to you then to choose the best way to express yourself, the way you are comfortable with. In production, we often go back and forth in order to improve the final iteration and generally you work with a talented illustrator.

ZBrush certainly offers a lot of freedom and flexibility for sketching in 3D, but are there any particular things that you commonly do in other packages which you feel ZBrush cannot handle as well?

The thing I definitely do outside of ZBrush is mapping and rendering. You have some very nice packages like Unfold 3D or UV Layout and the ability to update your mapping in ZBrush at any moment. ZBrush is not a 3D package, so for the rendering the concept of light, material and shadow is wrong. It's good if you just want to create a preview, but not enough to render more. For hair and fur, it's still better to use a 3D package. Another weak point in ZBrush is texturing. The ability to use the sculpting brushes for poly painting is just awesome, but texturing is just per vertex… it would be nice to be able to choose the resolution of your texture. So often, for texturing or photo projection, I use Mudbox.

"HAVING GOOD TECHNICAL AND ARTISTIC KNOWLEDGE IS A WONDERFUL PLUS."

What is some of the best advice you have been given or come across with regard to your development as a 3D character artist?

Passion is important. Without passion, there's no creation. Working hard and practicing is the second piece of advice. There's no magic; we have to manipulate heavy software and workflows and having good technical and artistic knowledge is a wonderful plus. Being creative is important too. We are in a period where there are a lot of sequels. We are slowly thinking less in order to sell more and that could be problematic in the future for overall quality. So don't hesitate to let your mind float by itself to change this mass effect.

Many thanks for talking the time to talk to 3DCreative and good luck for the future!

Thank you 3DTotal for your support!

CÉDRIC SÉAUT

For more work by this artist please visit:
http://www.khalys.net/
Or contact them at:
cedric.seaut@voila.fr
Interviewed by: Richard Tilbury


Igor - the watchmaker

ENROLL TODAY!

3D ANIMATION & GAME DESIGN

$3,000

NEW MEDIA CAMPUS

ONLINE TRAINING

New Media Campus, over the past 8 years of operation as a Post-Secondary School, has been providing talent for production companies worldwide. *Electronic Arts* and *Rockstar Games* are just two examples of companies that are employing New Media Campus graduates.
Our online school is designed to make our programs affordable for any budget without sacrificing quality education.

TUITION INCLUDES:

- Unlimited 12 Month Support from Industry Professionals.
- Personalized Critiques Directly from Instructors.
- Project Based Curriculum.
- Instructor Delivered Assignments for Each Project.

www.newmediacampus.com


www.ir-models.com
Offers high quality 3D Models, Video Tutorials and Digital Doubles,
With exclusive access to an ever growing Database of Freelance Portfolio models
Try our Pearl, Emerald or RUBY Memberships for Unlimited Downloads
ir-models
breaking the mold
www.ir-models.com
£75 'Pearl' Membership for 6 Months Access (excluding freelance files)
£100 'Emerald' Membership for 1 Years Access (excluding freelance files)
£350 'RUBY' Membership for 1 Years Access (all inclusive)
Why not join today?
©2009 IR-Entertianment ltd is registered in England and Wales Registration No. 6821592
Infinite-Realities® | www.ir-models.com | www.ir-ref.com | www.ir-ltd.net - All rights reserved.
Copyright © www.ir-models.com | Character models by Ensar Yanar, Majid Smiley, Lee Perry-Smith, Alexander Tomchuk and Benjamin Leitjeb


THE GALLERY
This Month we feature artwork from:
Gerardo Barbero
Cesar Martinez Alvaro
Romain Chassefiere
Verlinden Lionel
Andrei Szasz
Kevin Gauthier
Alexis Van der Haeghe
Michal Kwolek
Rebeca Puebla
Sven Juhlin

Modern House - Night

Verlinden Lionel
http://www.miysis.be
lionel.verlinden@miysis.be
(Above)

Speed Demon

Gerardo Barbero
gdbarbero@hotmail.com
(Below)


69
SCXU
493
BM
MGW
TARE
PAYLOAD
CUBE


AIR FORMULA ONE
Michal Kwolek
http://www.kwolek.org
kreska90@o2.pl
© Michal Kwolek

Night Trains

Cesar Martinez Alvaro

http://kaesar30.cgsociety.org/gallery/

kaesmartin@hotmail.com


Cargo TRANS

Foothills

Kevin Gauthier

kmgauthier@basspro.com

Zombie

Romain Chassefiere
http://www.woone-art.fr
woone@woone-art.fr
(Right)

"Papageno" - The Bird Catcher

Alexis Van der Haeghe
http://www.vdhalexis.com
vdhalexis@hotmail.com
(Below)

Who is Spock?

Andrei Szasz

http://www.andreiszasz.com/

andrei.szasz@yahoo.com

Twisted Dolls: The Butcher's Bride

Rebeca Puebla
http://rebecapuebla.blogspot.com/
rebecapuebla@hotmail.com

JINX

Sven Juhlin
http://www.daybreakcg.com/
sven@daybreakcg.com
© Sven Juhlin

Flip to Page 088 for the final part of our new Mega Tutorial Series

NEXT GEN CHARACTER CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

Follow

The final installment in this series will discuss setting up a light rig, creating a shader for our character and show how to apply the numerous textures made in the previous chapter. The notion of body hair through the use of alpha maps will complete the character, before concluding with some additional accessories in the form of shackles, a chain and a wooden club.

So if your interested in seeing the final chapter of this amazing new series, please flip to the back of this magazine and enjoy.

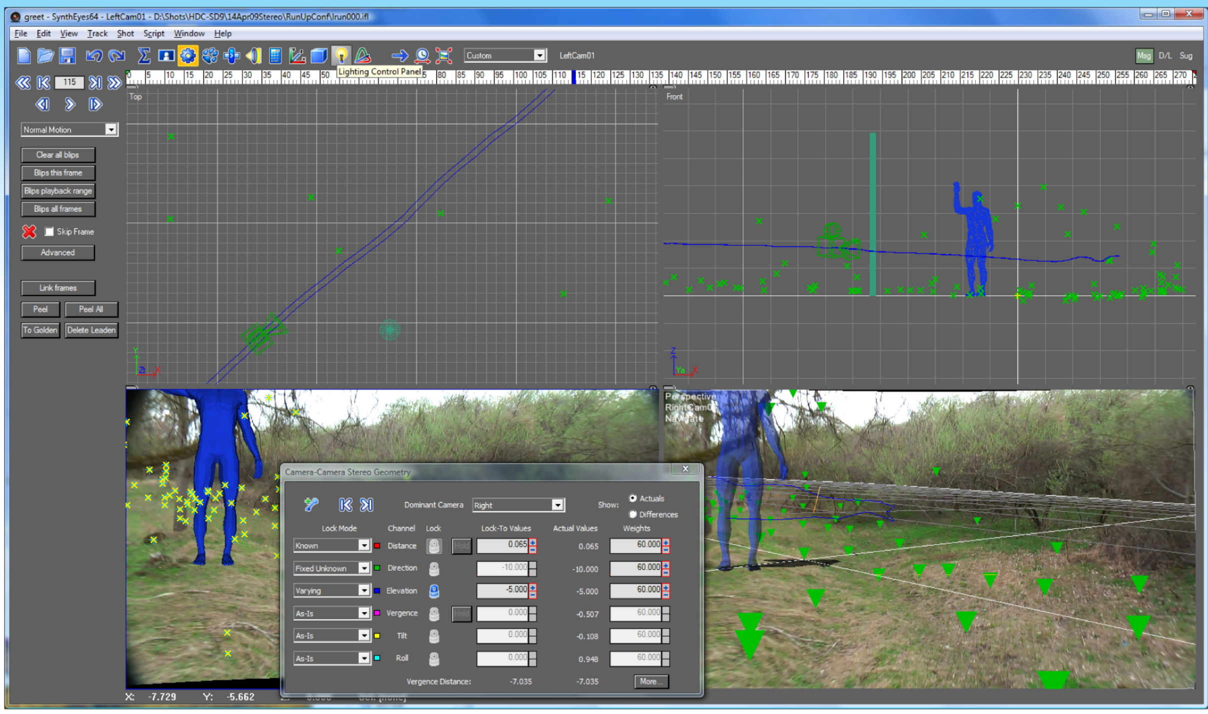
3DSMAX | PAGE 088
LIGHTWAVE | PAGE 120
MAYA | PAGE 142
MODO | PAGE 162

ZBRUSH 3ds max lightwave MAYA modo

SynthEyes

Match-moving and Stabilization

Now with STEREOSCOPIC 3D support!



Available in both 32- and 64-bit versions for both PC & Mac starting at $399

“Whatever happened to `get a cup of coffee while the tracker is solving´?”

“I just loaded a quick file into the demo I downloaded, I am blown away.”

“Saved my life!”

Typical Applications
Fixing Shaky Shots
Virtual Set Extensions
Animated Character Insertion
Product Placement in Post-Production
Face & Body Motion Capture
Talking Animals

“The software is amazing”

“You've got a great product at an incredible price.”

ANDERSSON TECHNOLOGIES LLC
http://www.ssontech.com
Sixth year in the market, serving artists in over 60 countries

"I CAN GO AS FAR TO SAY THAT THESE TECHNIQUES HAVE CHANGED MY LIFE!"

Photoshop for 3D

This series of tutorials aims to show the value of post-production and more specifically the ways in which Photoshop can be used to aid the 3D pipeline. Over the course of six chapters we shall focus on the various tools and techniques on offer in Photoshop that are frequently used to improve 3D renders. Compositing passes, adding particle effects, improving lighting and making general colour adjustments are a few of the topics covered, as well as ways to create backgrounds that both complement and enhance characters. The methods presented within this series can provide an efficient alternative to lengthy render tests and experimenting with numerous settings, and will enable artists to seamlessly blend 2D techniques into a 3D process, resulting in a versatile and streamlined workflow.

CHAPTER 1
Render Passes

CHAPTER 2
Retouching Final Renders

CHAPTER 3
Lighting & Special Effects

CHAPTER 4
Curves, Levels, Colour Balance & Layer Styles

CHAPTER 5
Layer Masks & Adjustment Layers

CHAPTER 6: CREATING BACKGROUNDS FOR CHARACTERS

We conclude this series with a look at how to create a backdrop for a character which is both complimentary and at the same serves to enhance and emphasise them. We will compare two very different approaches and hopefully through them will show how each character type requires a unique interpretation

Part 6 - Creating Backgrounds for Characters

Software Used: Photoshop (and your 3D software of choice)

This tutorial will aim to show you how to use Photoshop to compose a still image; using some nice renders and masks we will discover an efficient way to achieving a good image which will enable you to easily change and test colors and settings in the post-production stage. We'll then continue by looking at how to create backgrounds for our 3D characters. So let's get started.

In this first example, after modeling my character in 3ds Max and choosing an interesting and appropriate pose for him, I make five basic render passes – render out these passes for one of your own character images and follow along:

- **Render Layer 1** – Glossy metal (**Fig.01**)
- **Render Layer 2** – Car Paint shader (I've used the same pass to render the black parts that will look like rubber accessories later on) (**Fig.02**)

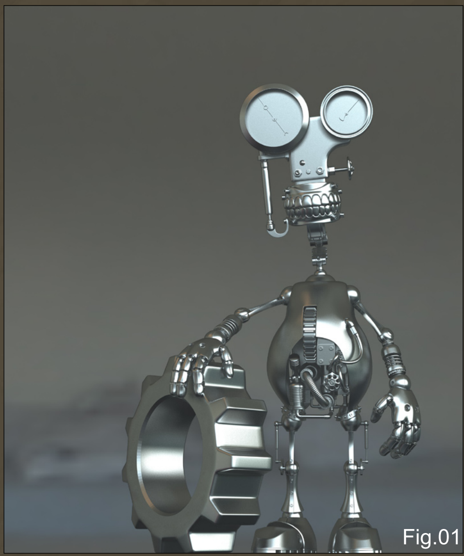


Fig.01


Fig.02

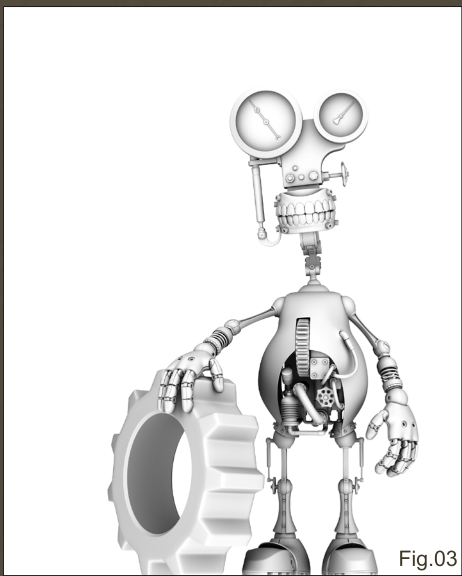


Fig.03


Fig.04

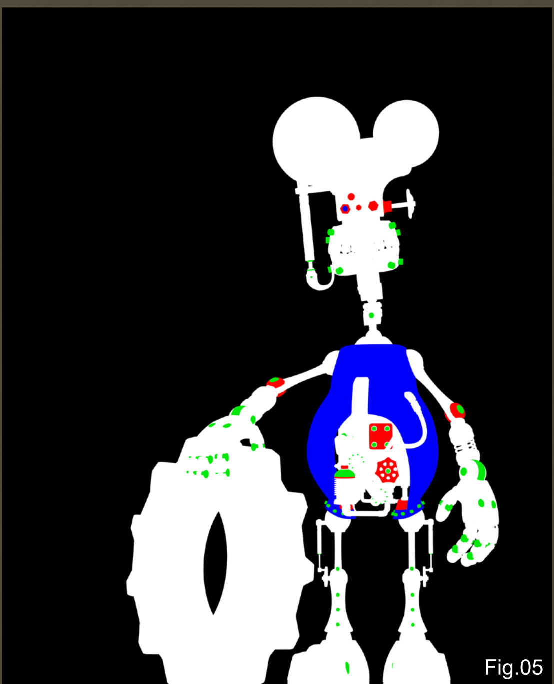


Fig.05

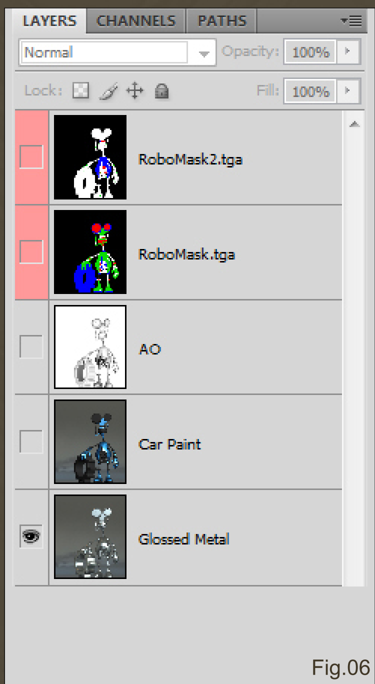


Fig.06

- **Render Layer 3** – Ambient Occlusion (**Fig.03**)
- **Render Layer 4** – Here I've had to render each part with a different color as these will be used to select each part to make masks and adjustments (**Fig.04**)
- **Render Layer 5** – This one was done in the same way as the last, but with more details to get all those screws and small parts (**Fig.05**)

With all the render passes ready, we can now go into Photoshop. We need to open all these renders in the same PSD file, so go to File > Scripts > Load Files Into Stack, click on

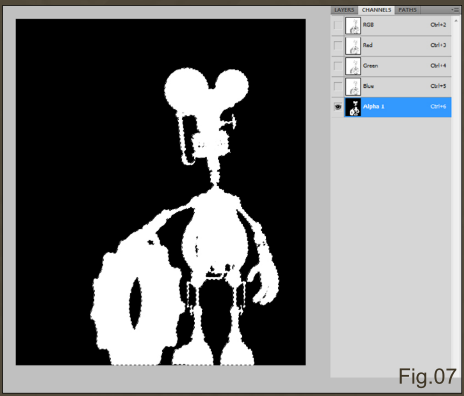


Fig.07

Browse, then select the five renders and click OK. Rearrange the layers into the rendered sequence and hide all layers apart from the first one (**Fig.06**).

First things first, we need to create a mask for the first image of the composition, so go to Channels, hold the Ctrl key on your keyboard, and click on the Alpha thumbnail to make a selection of the character's silhouette (**Fig.07**).

Back to the layers palette now, press the "Add layer mask" button to create a mask for the character. Connect the two layers above by holding the Alt button on your keyboard and clicking between the two layers. We then want to create a black layer for our background (**Fig.08**).

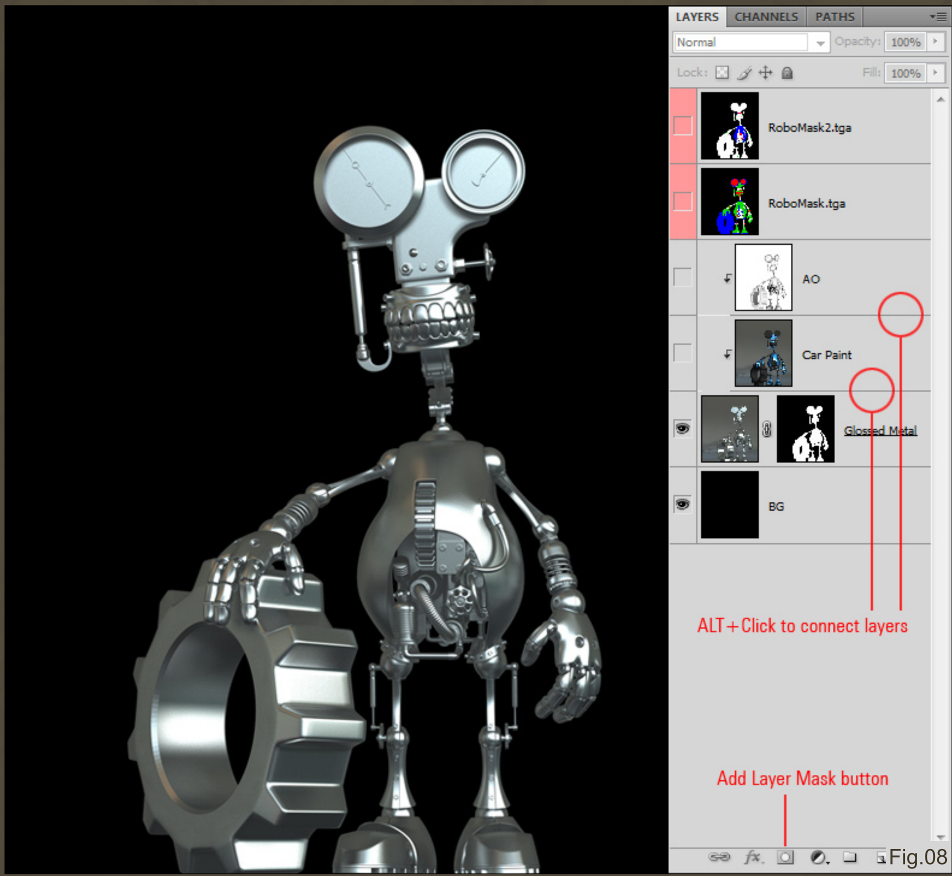


Fig.08

Unhide and select the rendered mask layer with the part you want to select, press the Magic Wand Tool (W on your keyboard), hold Shift on your keyboard, and then select the parts where you want the Car Paint shader and the black parts to appear (**Fig.09**).

Hide the mask layers now. Then unhide the Car Paint shader layer and select it, and click on the "Add layer mask" button again (**Fig.10**).

If you've forgotten to select some parts – no problem! We just need to go back to the mask

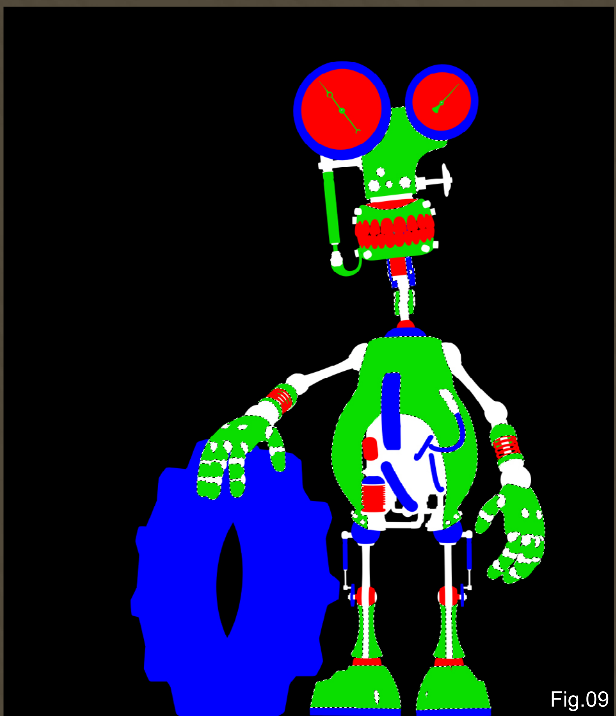


Fig.09

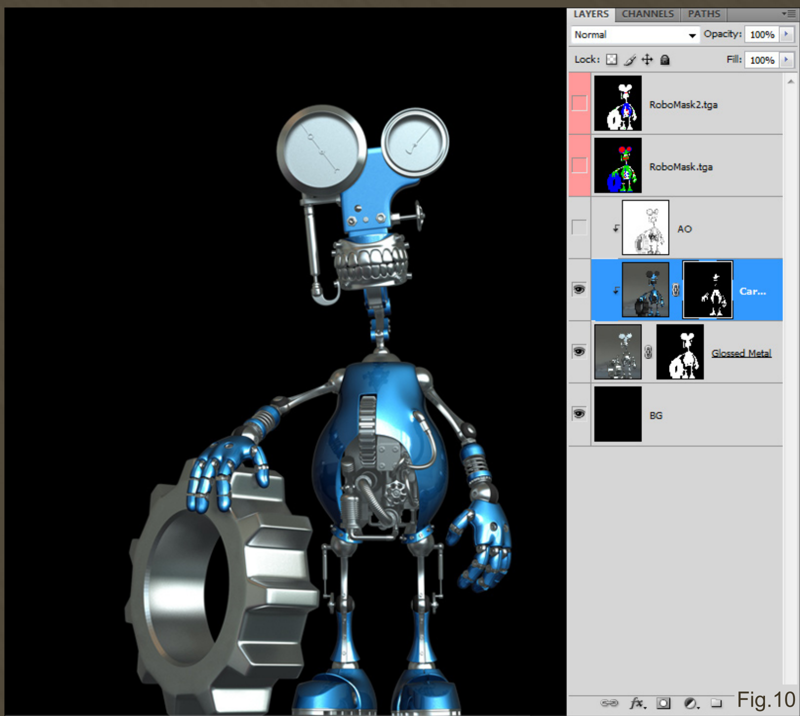


Fig.10

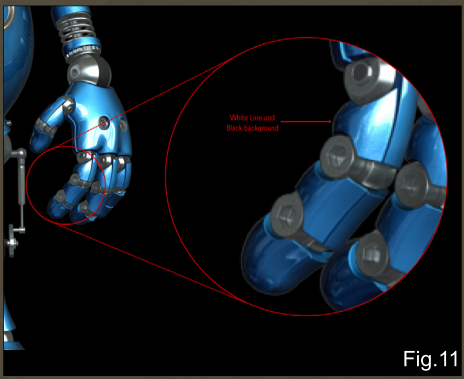


Fig.11

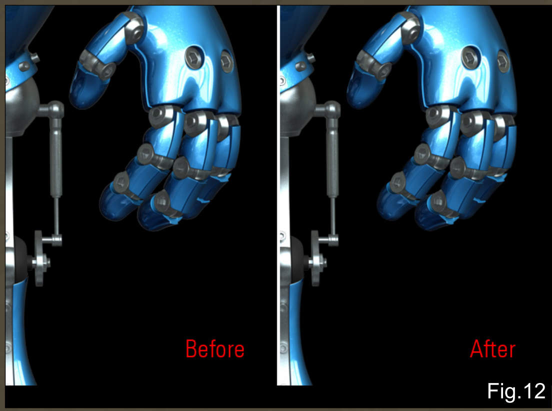


Fig.12

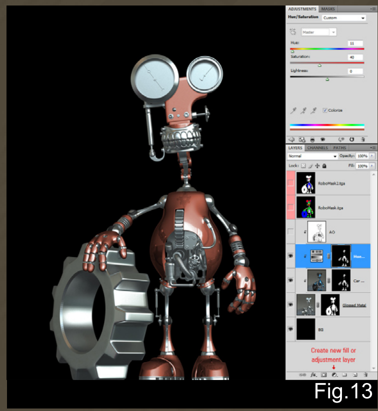


Fig.13

layers, select the parts we want to appear, press the D shortcut key on our keyboard to reset the color palette to black and white, and then with the mask of the Car Paint shader layer selected, press Ctrl + Backspace to paint the selected parts in white.

Sometimes a line with a color that doesn't correspond to the background appears (**Fig.11**).

To fix this, we can hold down Ctrl and click on the thumbnail of the first glossy metal layer, selecting the silhouette. Press Ctrl + Shift + I to invert the selection, and use the right arrow key on your keyboard to move the selection one pixel across to the right. Press Ctrl + H to hide the selection that's still there. Then with the black brush, paint this area to remove the white line. Do this for the left side, too (**Fig.12**).

Now the fun begins! Let's change the blue metal color for another one: using the self-illumination renders, select the parts that correspond to the blue Car Paint shader, click on the "Create new fill or adjustment layer" button, and select Hue/Saturation. Select Colorize and you can then play with different choices of colors for these metal parts (**Fig.13**).

Fig.14

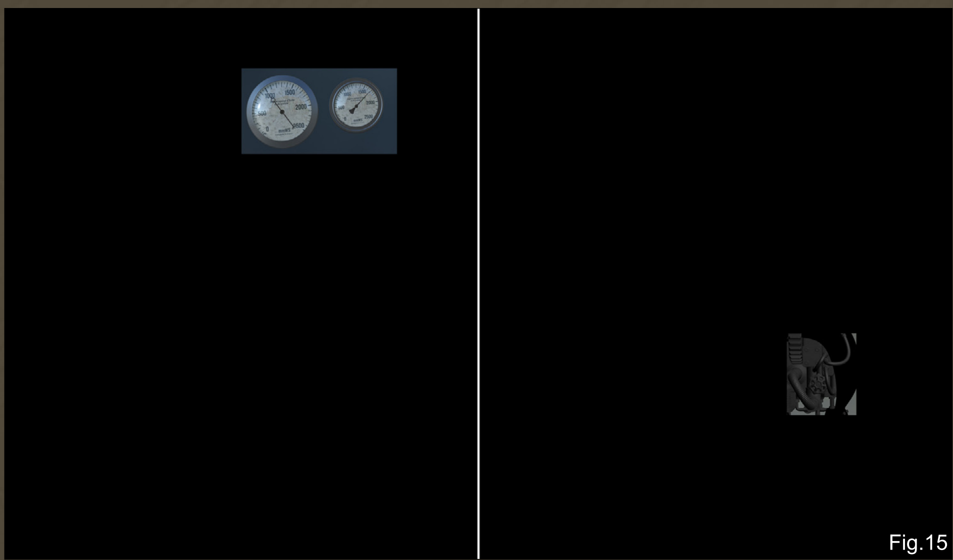


Fig.15

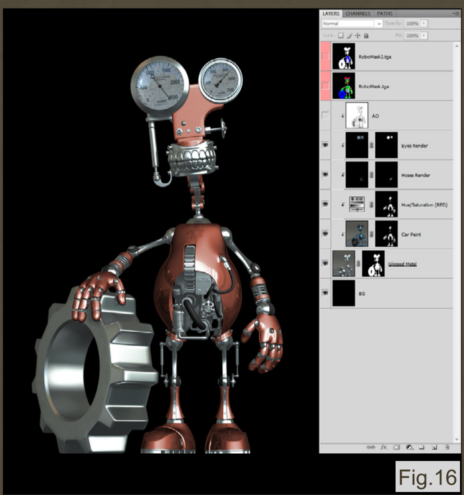


Fig.16

Let's now add more detail to this image. For this purpose, I've rendered a texture for the manometer eyes, and for those pipes in his belly (**Fig.14**).

In your 3D software, remember to set the area to render to Region (if you're using 3ds Max), and then scale the selection around the object you want, and render it. This way, when you import this render as a new layer in Photoshop, it will fit perfectly in your composition (**Fig.15**).

Import these new render layers into your PSD file and select the parts that correspond to the eyes. Select the eyes layer and click the "Add layer mask" icon. Do the same for the hoses (**Fig.16**).

Turn on the Ambient Occlusion layer and choose a good opacity for your image – I've set mine

to 80% – and then change the layer blending mode to Multiply (**Fig.17**).

Use the masks to make some adjustments to your image now, like Curves, Color Balance, or whatever it needs (**Fig.18**).

I've missed some reflections on the face and glasses, so I've changed the HDR image for another one that has some different reflections in these areas. I've used masks to make these images appear only in the reflective parts, and I change the layer blending mode to Overlay as the finishing touch (**Fig.19**).

Now let's dirty the image up a little – we'll need some dirty and scratched maps for this job (**Fig.20**).

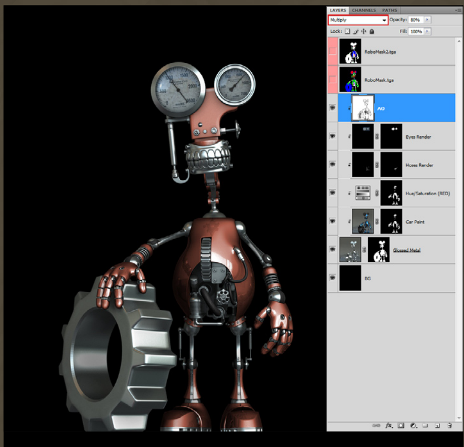


Fig.17

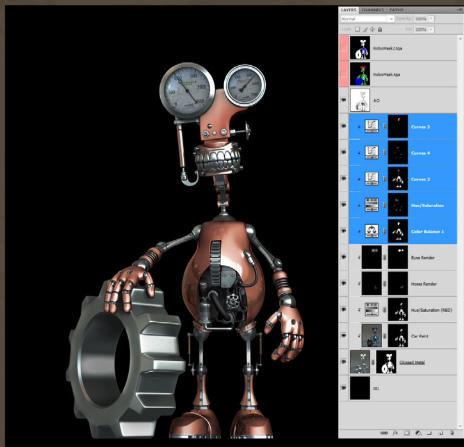


Fig.18

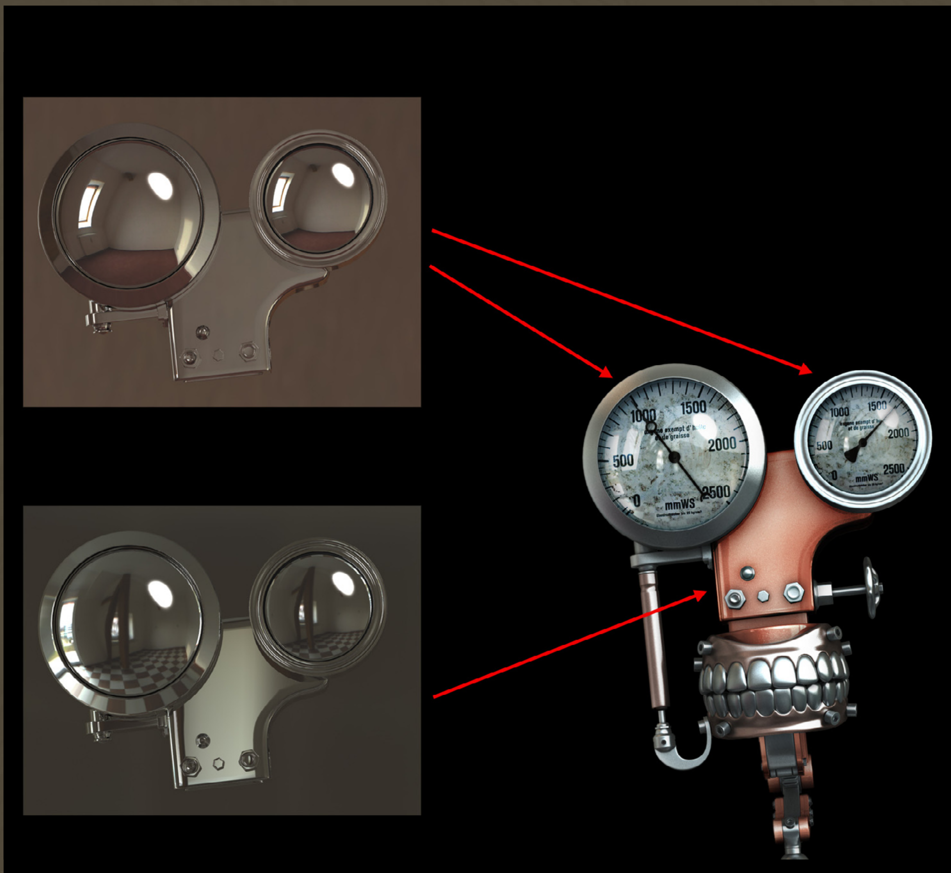


Fig.19

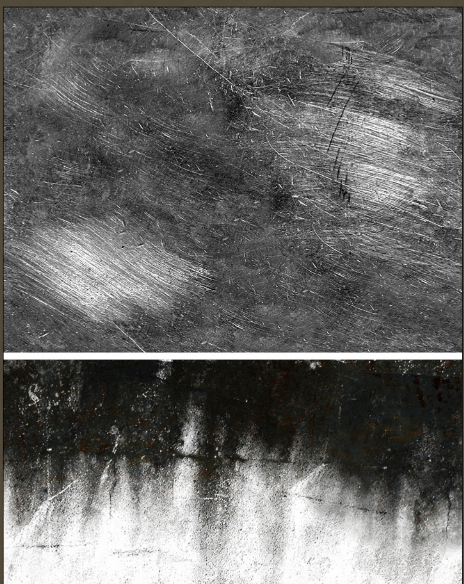


Fig.20

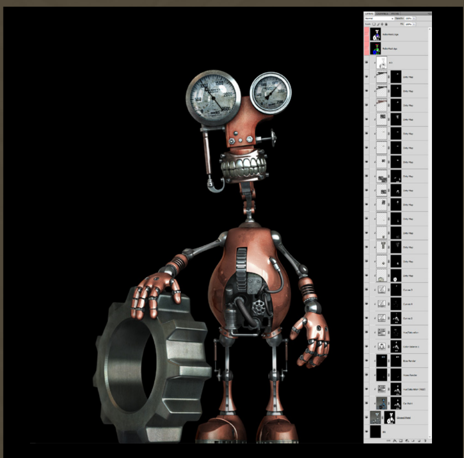


Fig.21

In the same way that we've made all the masks, use the self-illumination renders to mask these dirty maps to each part of the model. You can repeat parts, rotate and copy using the Clone Stamp Tool – whatever it needs – and then change the blending mode. Sometimes it will look good in Overlay, sometimes Multiply or Soft Light; you'll need to test the different settings out on your own composition to discover what the best blending mode to use is for your own purposes. If you need to, you can also adjust the Levels of the maps for better contrast in your textures, and then find a better opacity for their layers (**Fig.21**).

Now select all layers – except the background and the two self-illumination mask layers – and press Ctrl + G to group them, just for a better workflow (**Fig.22**).

For the background, I've mixed two maps (**Fig.23**) and placed them above the black

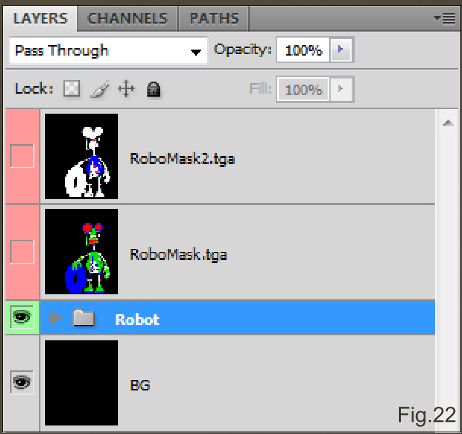


Fig.22


Fig.23

background layer. I select the first layer, hold Alt and hit the "Add layer mask" button – this creates a black mask. With a white brush now, I paint the areas where I want the map to appear. Do this with the other layer, too, and then change it to Overlay (**Fig.24**).

Now it's time to make some final adjustments, the first one being to the Hue/Saturation: enable the Colorize check box and enter zero for the two parameters above; change the blending mode to Overlay and find a good Opacity. This will make the image get a nice contrast (**Fig.25a**).

Let's simulate a glow effect now: go to Channels, and choose the channel that has the most contrast – in this image it's the blue one – and duplicate it, dragging the channel to the Create New Channel button. Press Ctrl + L


Fig.24


Fig.25a

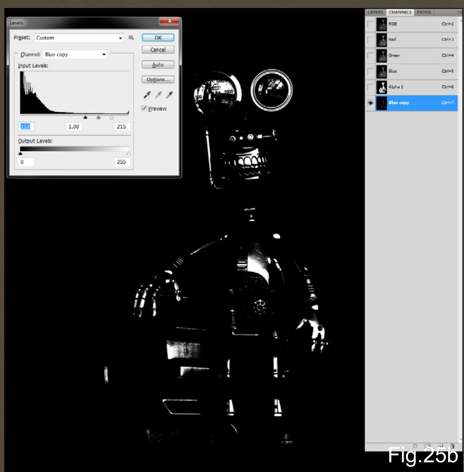


Fig.25b

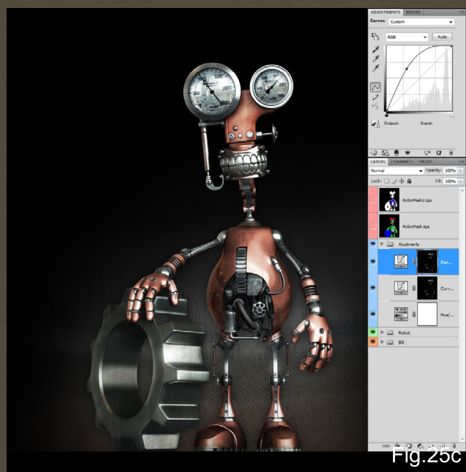


Fig.25c

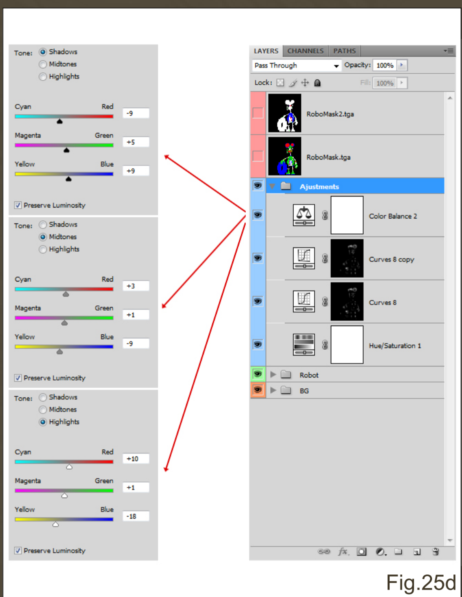


Fig.25d

for Levels, and make an adjustment to increase only the highlights (**Fig.25b**).

Now hold Ctrl and click on the thumbnail of this channel to select only the white parts. Go back to the layers and put a Curves adjustment to clear it. Now go to the masks and feather it to look like a glow effect – if it needs it, duplicate this new layer to get more of a glow, and then paint in black the parts that are exaggerated (**Fig.25c**).

The last adjustment to make is a Color Balance one (**Fig.25d**).

And here we have the final image. You can have fun changing the colors, making adjustments and finding out what best fits your needs (**Fig.26**).

The second tutorial example is a character that I created at Infinity Design (www.infinitydtv.com) for the Brazilian company, REF Comunicação

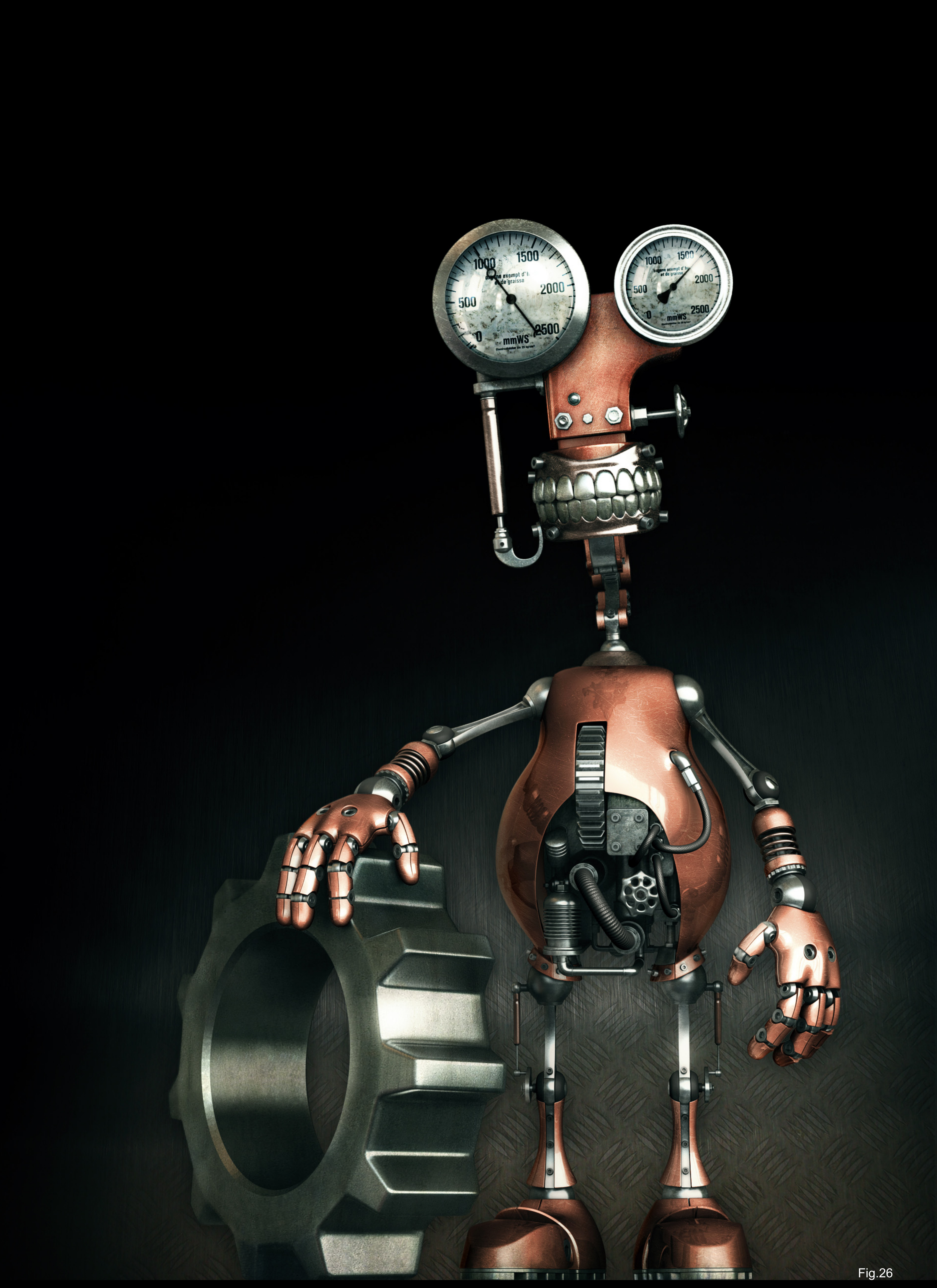


Fig.26


Image © REF Comunicação, www.refcomunicacao.com.br.
Fig.27

(**www.refcomunicacao.com.br**). I will use this image set to show you how to create a background for your own characters (**Fig.27**).


Fig.28

After I composed the character in the same way as I did for the robot, I merged all layers together for each pose, and opened then in a PSD file. I also created a white frame to separate the three poses (**Fig.28**).

We need to make three render passes:

- **Render Pass 1** – The first one needs to be our Ambient Occlusion pass. In your 3D software, select the entire character, keeping only the parts that touch the floor, and hide it. Select these parts, right-click, and go to the Object Properties. In 3ds Max, I disable the check box Visible to Camera and click OK, as this makes the shoes affect the floor but doesn't appear to render. It keeps only the floor visible to the camera and renders it. I do the same thing for the other two poses, as well (**Fig.29**)

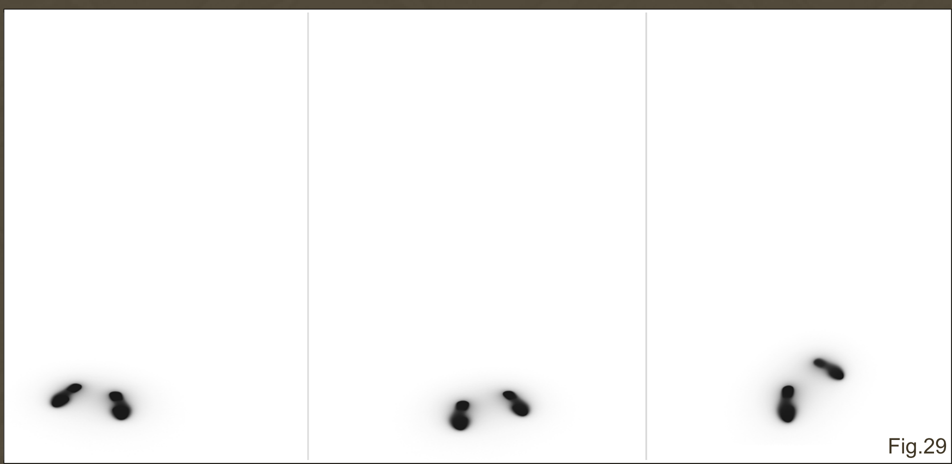


Fig.29

- **Render Pass 2** – I configure a black Matte Shadow, only to reflect. I disable the Visible to Camera check box and render it, doing the same for the other two poses (**Fig.30)**

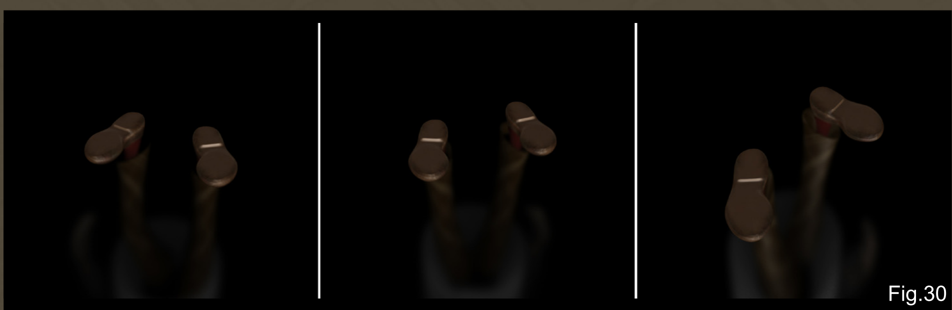


Fig.30

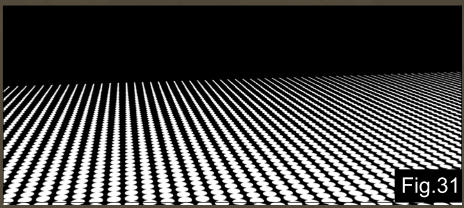


Fig.31

• **Render Pass 3** – For the third and final render layer I make a quick design for the floor in 3ds Max (**Fig.31**). A texture map looks good too – you could use a wood map, for example.

In Photoshop, I create a Gradient color for the background, import the new renders and position them in the right order, grouping each series of renders for a better workflow. I then hide them (**Fig.32**).

Unhide the Reflections group and change the blending mode of the group to Screen. Click on the “Add layer mask” button to create a white mask for this group. Press D on your keyboard to reset the color palette to black and white, and then, with the Gradient Tool, paint a small gradient at the bottom to smoothly fade out the reflections (**Fig.33**).


Fig.32

Turn on the Ambient Occlusion group now, change the blending mode to Multiply, and find a good Opacity setting (**Fig.34**).


Fig.33


Fig.34

Now Unhide the Floor Design layer, change it to Screen, and find a good Opacity. Make a gradient mask to fade out the top, and with a black brush, paint the parts you don’t want to appear (**Fig.35**).

If you have Photoshop CS4, go to the Masks tab and feather it a little; if you have an earlier version you can select the mask, go to Filter > Blur, and apply a Gaussian Blur to smooth this mask (**Fig.36**).

I’ve chosen to change the background color for each pose. To copy this technique, make a selection around the pose, and inside the white frame go to the “Create new fill or adjustment layer” icon, apply Hue/Saturation, and enable the Colorize check box. I’ve used a green color for the left background, purple for the right one, and I’ve kept the central one orange; I also use a Curves adjustment for added contrast and enhanced colors (**Fig.37**).

Now let’s make some adjustments that will really make him “pop” in the scene! First of all we can simulate a backlight, so choose the Elliptical


Fig.35

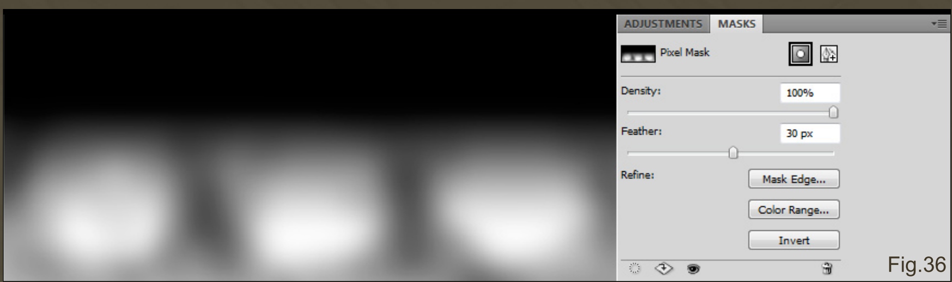


Fig.36


Fig.37

Marquee Tool and, holding down the Shift key, make an oval selection over each pose (**Fig.38**).

Apply an exaggerated Curves adjustment to clear the selected oval areas (**Fig.39**).

Go to the Masks tab (if in PS CS4) and feather the mask with a good value (again, you can use the blur options in earlier versions of PS if you're not running CS4) (**Fig.40**).

Now hold down Ctrl + Shift and click on the three character thumbnails to select them (**Fig.41**).

Again, you'll want to use a Curves bar to clear this, and feather the mask a little to create a glow effect. With a black brush, paint the dark areas around the character, and we the result is our final image (**Fig.42**).

Fig.38

Fig.39

Conclusion

I can go as far to say that these techniques have changed my life! No longer do you have to lose hours setting up a final render for your image for just one pass, and then render more and more passes, make tests and adjustments as necessary … you can also even add details that weren't even modeled when you first came up with the concept! The possibilities are endless.

Fig.40

Fig.41

Image © REF Comunicação, www.refcomunicacao.com.br.

Fig.42

You can check out more illustrations made using these techniques on my website. I hope you've enjoyed this tutorial, thanks for reading!

Fabio M. Ragonha
For more from this artist visit
http://www.fabiomr.com/
or contact
fabioragonha@yahoo.com.br

nPower CAD Translators for Maya

Break thru the Maya CAD barrier with high performance translation technology from nPower.

Go Beyond

- Accelerated Translation.
- NURBS/Solids Engine.
- Absolute Precision.
- Supports: IGES, STEP, SAT, and Rhino models.
- New Support for Maya on the Macintosh.
- Advanced Memory Management.

NPOWER SOFTWARE

To find out more about nPower CAD Translators for Maya Visit us at www.nPowerSoftware.com


Learn Animation from the Best in the Business
Think Tank
TRAINING CENTRE
www.tttc.ca

"V-Ray has four ways of interpreting GI, which can be assigned to primary or secondary light bounces. We will look into V-Ray's technical aspects for now, explaining all the settings to help you understand its finer workings."

V-Ray for 3ds Max

Chapter 1 - Vray Global Illumination

Welcome to the V-Ray for 3ds Max tutorial series which will cover all the key parameters of V-Ray: global illumination, materials, lighting and more. We will look in-depth at each setting – how it works, what repercussions it has – and we will also take a peek at some of the special features that V-Ray has to offer. If you've ever had any doubts about how to get into V-Ray, or you simply would just like to know a little more about a particular section of the software, this series is for you!

Chapter 2: Materials - Issue 53 January 2010
Chapter 3: Vray Settings - Issue 54 February 2010
Chapter 4: Lights - Issue 55 March 2010
Chapter 5 Plugins - Issue 56 April 2010

V-Ray for 3ds Max Chapter 1 - Vray Global Illumination

Software Used: V-Ray, 3ds Max

This series of tutorials is dedicated to the V-Ray renderer for 3ds Max, and will guide you through V-Ray's most important features. Here is a quick look at V-Ray's GUI before we get started:

Irradiance Map GUI (**Fig.00a**)
Light Cache GUI (**Fig.00b**)
Photon Map GUI (**Fig.00c**)

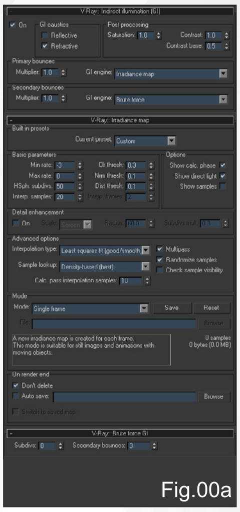


Fig.00a

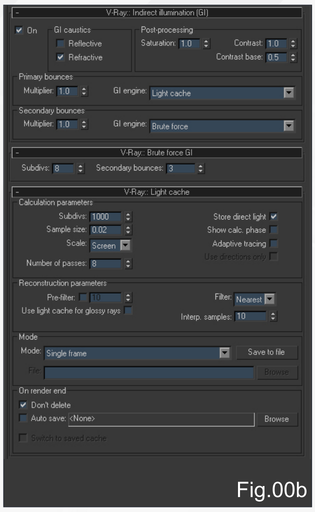


Fig.00b

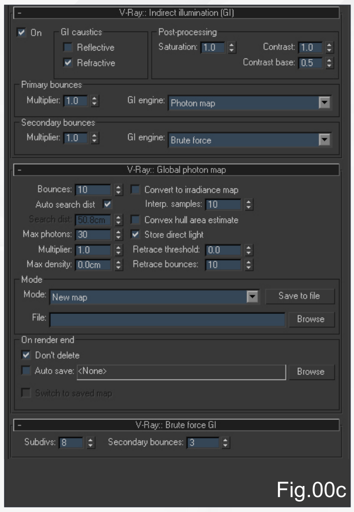


Fig.00c

Global Illumination

This first chapter of this V-Ray for 3ds Max tutorial series will cover Global Illumination in V-Ray, looking at the following topics:

GI Modes

- **Irradiance Map**
- **Brute Force**
- **Light Cache**
- **Photon Map**

How To

- **Create ambient occlusion**
- **Use Progressive path tracing**
- **Make GI previews**

Lighting a Scene with only GI

- **Find the right Solution for your scene**
- **Conclusion**

Before you begin anything, it is always recommended to work in scale, whether it is inches or centimeters, just to have a physically viable scene. We are going to begin the series with V-Ray's impressive Global Illumination, talking in detail about all the various settings and modes it has to offer.

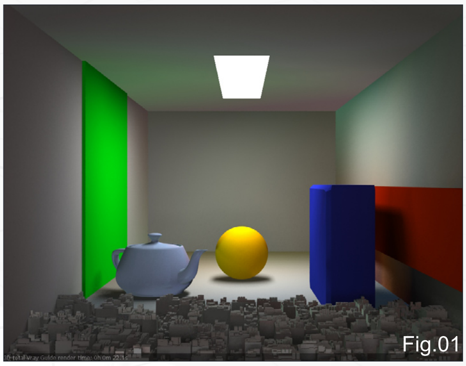


Fig.01

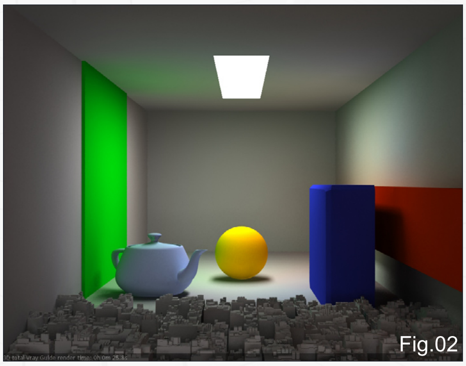


Fig.02

GI Modes

V-Ray has four ways of interpreting GI, which can be assigned to primary or secondary light bounces. We will look into V-Ray's technical aspects for now, explaining all the settings to help you understand its finer workings.

Irradiance Map

Irradiance Map (IR Map) is the base of V-Ray's GI engine, and in most cases you will use this solution; it is versatile and easily configurable for high detail or previews, adapted to animation and stills. To put it simply, the Irradiance Map will compute GI more accurately where there are fine details, and coarsely where you have flat surfaces.

Basic Parameters

This is a multi-pass GI solution; the difference between the minimum and maximum rates will give you the number of passes computed by V-Ray at render time.

Min/Max Rate: These are the most important settings of V-Ray's Irradiance Map solution: the Min rate determines the resolution of the coarse GI pass; the Max rate determines the resolution of the finest GI pass computed (a value of -1 will compute an image half the size of the final image; a value of +2 will compute an image four times more detailed than the final image).

The Min rate should always be negative in order to speed up the rendering of flat surfaces; you can go as low as -6 with some gain in render times, however, lower settings might actually slow down the render!

The Max rate, on the other hand, defines the amount of fine details you will see in the GI solution. It will also dramatically slow down render times as you increase it: a value of -2 or -3 is good for visualization; however, for final renders you will want to push this to, or above, -1.

Fig.01 Max rate:-6
Fig.02 Max rate: -4
Fig.03 Max rate: -2
Fig.04 Max rate: 0

Note: these values are for a screen resolution of 800*600, for high resolution renders you can

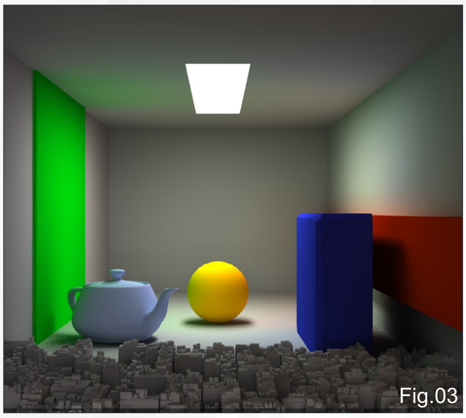


Fig.03

decrease the min and max rates and still get good results.

Fig.05 Resolution 1024*768 – Max rate: -2
Fig.06 Resolution 2048*1536 – Max rate: -4

Color Threshold: Advanced setting: reduce to increase image quality; keep this on default in most situations (0.2).

Normal Threshold: Advanced setting: reduce to improve V-Ray's perception of curved surfaces and fine details. Keep this on default in most situations (0.1).

Distance Threshold: Advanced setting: determines V-Ray's sensitivity to distance between objects. Keep this on default in most situations (0.1).

Hemispherical Subdivision: This controls the quantity of GI samples emitted from a light source: increase this number to get a smoother result; you can reduce it to gain speed but it might get incorrect results and noise. This setting has a direct effect on render times.

This setting can be very useful if you are only using one light source for an entire scene (e.g. Sunlight through a window, bouncing of the walls and floor etc.): a smaller setting will make the GI calculation go faster but will give blotchy results; a higher setting will smooth the GI and accentuate the details but will increase render time. 50 is the basic value, but some scenes might need 100 or more.

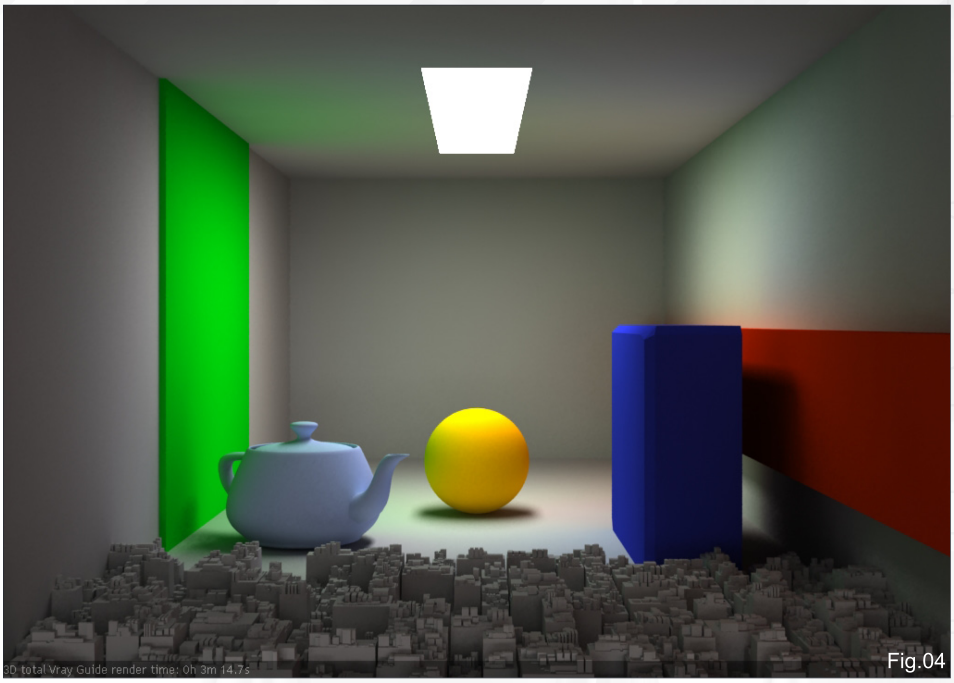


Fig.04

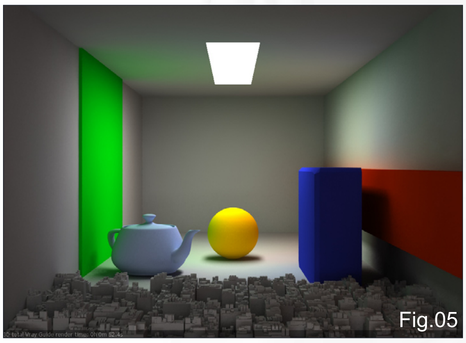


Fig.05

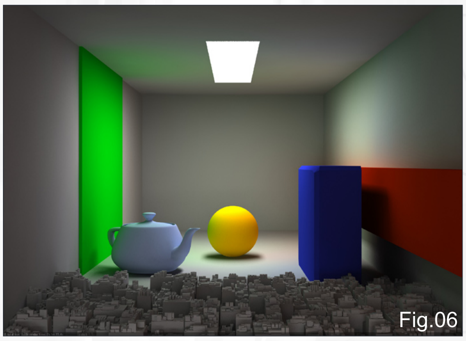


Fig.06

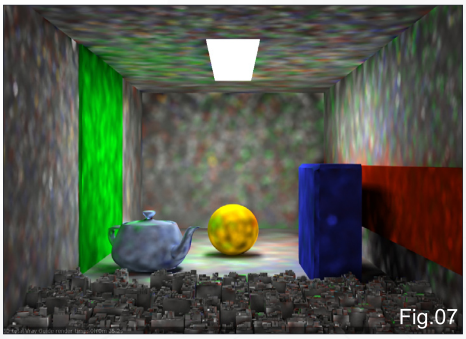


Fig.07

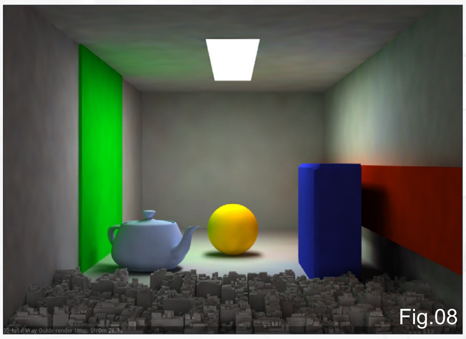


Fig.08

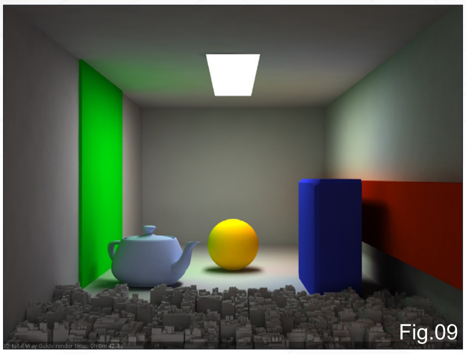


Fig.09

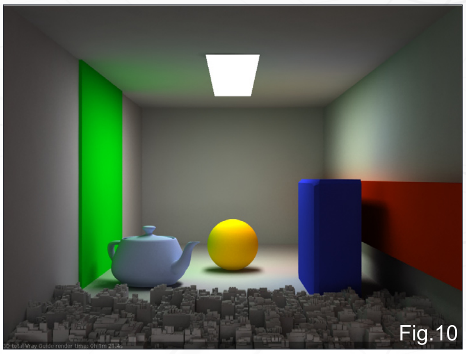


Fig.10

Fig.07 HSph Subdivs: 1
Fig.08 HSph Subdivs: 5

Fig.09 HSph Subdivs: 25
Fig.10 HSph Subdivs: 50

Interpolation Samples: Sets the amount of samples to be used to compute the final GI solution: small values will sharpen the GI while adding blotchiness; larger values will smooth the GI as more samples will be used to make an average – usually keep around 5-15.
To increase with Hemispherical Subdivisions – for example, if you set Hemispherical Subdiv. to 150 – you can set Interpolation Samples to 30-40.

Fig.11 Inter samples: 2
Fig.12 Inter samples: 4
Fig.13 Inter samples: 8
Fig.14 Inter samples: 15

Interpolation Frames: Only used in animation, this will compute additional GI passes to prevent flickering in the final animation.

Note: this is connected to Interpolation Samples and will multiply the number of passes: [2*(*interpolation frames*)+1]*interpolation samples

For example:

Inter sample = 20
Inter frames = 2
Number of passes = (2*2+1)*20 = 5*20 = 100

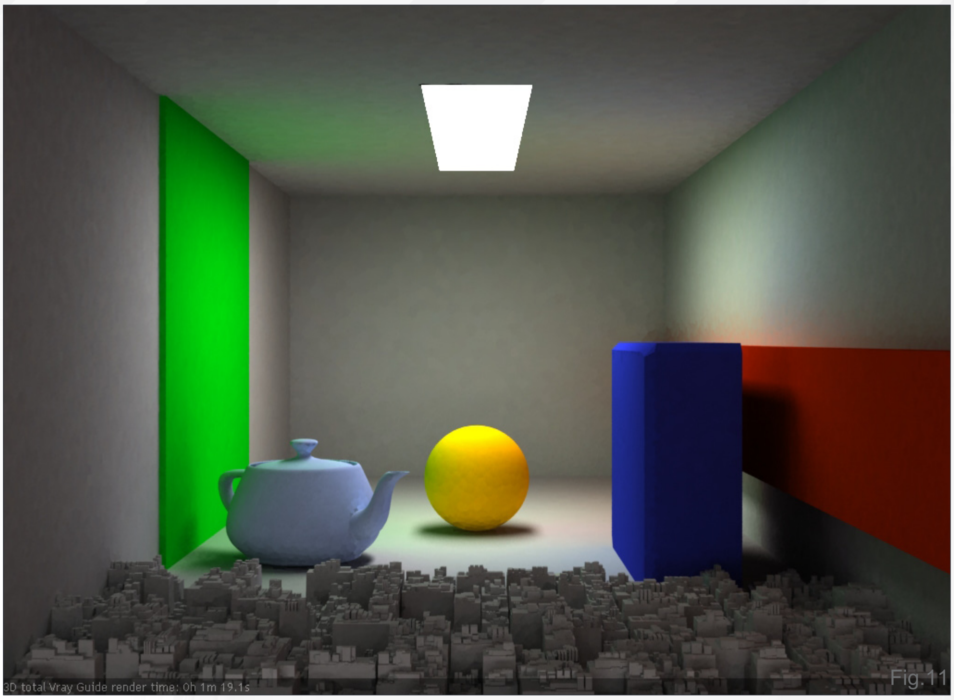


Fig.11

You can reduce the number of Interpolation Samples when Interpolation Frames are used to speed up rendering.

Show Calc. Phase: Will show the GI's progress in the frame buffer during rendering.

Show Direct Light: will also show direct lighting in addition to the GI solution in the frame buffer during rendering, only work with show calc phase.

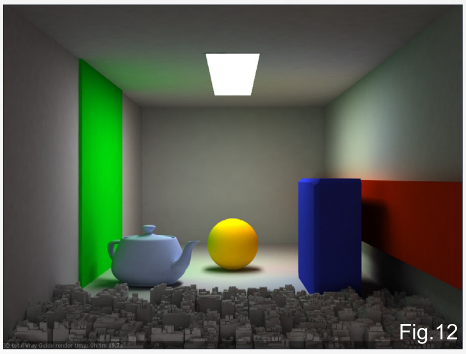


Fig.12

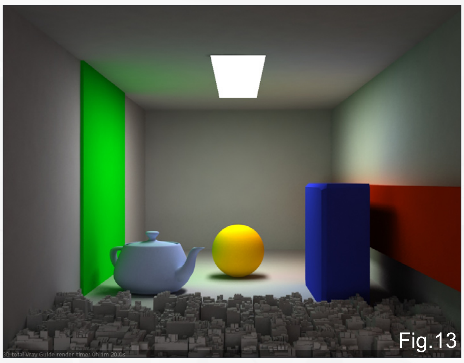


Fig.13

Show Samples: Will represent the density of V-Ray's Irradiance Map samples in the final render, displayed as dots.

Detail Enhancement: This increases the GI accuracy for small details, just as Ambient Occlusion would, but without the use of a separate pass. In a way, it works as Ambient Occlusion: increasing light variations around fine details.

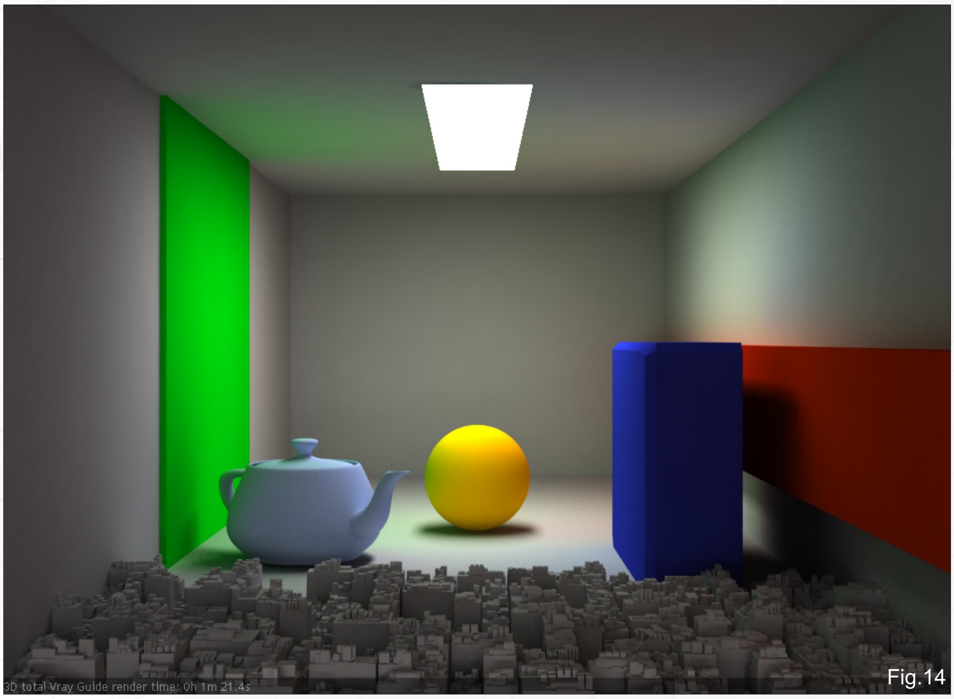


Fig.14

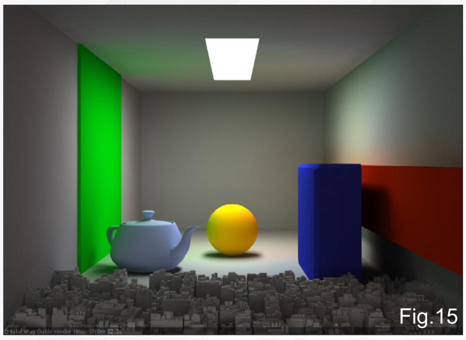


Fig.15

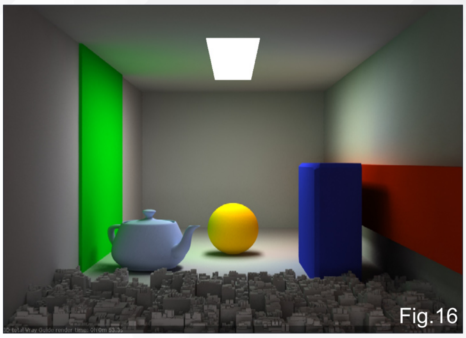


Fig.16

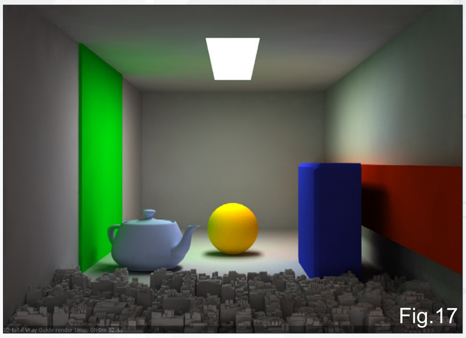


Fig.17

Radius works the same way as it would with Ambient Occlusion.

Subdivision multiplier is similar to brute force's subdivision setting.

Interpolation Types:

Weighted Average: Smoothes the GI samples; produces blotchy results – perfect for speed.

Least Square Fit: IR Map's bread and butter; however, it is also a smoothing method that will lose some fine details – increase the Min and Max rates, or you can use Ambient Occlusion to get those details back.

Delone Triangulation: Produces sharp results: this method produces high quality images with good attention to details; however, it will render slower, and will need an increase in the Max rate and hemispherical subdivisions to remove the noise.

Least Square with Voronoi Weights: A modification of Least Square fit, but slower – one to avoid!

Fig.15 Weighted Average
Fig.16 Least Square Fit
Fig.17 Delone Triangulation
Fig.18 Least Square with Voronoi Weights

Sample Lookup: Use nearest only for previews: quad balanced is good for general use, as well as overlapping; density based is by far the best of the series and should be exclusively used for final renders!

Calc. Pass Interpolation Samples: Should be kept between 10 and 25, this determines the number of iterations it will need in order to find to correct result.

Fig.19 Calc. Pass Interpolation Samples: 1
Fig.20 Calc. Pass Interpolation Samples: 2
Fig.21 Calc. Pass Interpolation Samples: 5
Fig.22 Calc. Pass Interpolation Samples: 10

Check Sample Visibility: Check this if you have problems with light going through thin objects.

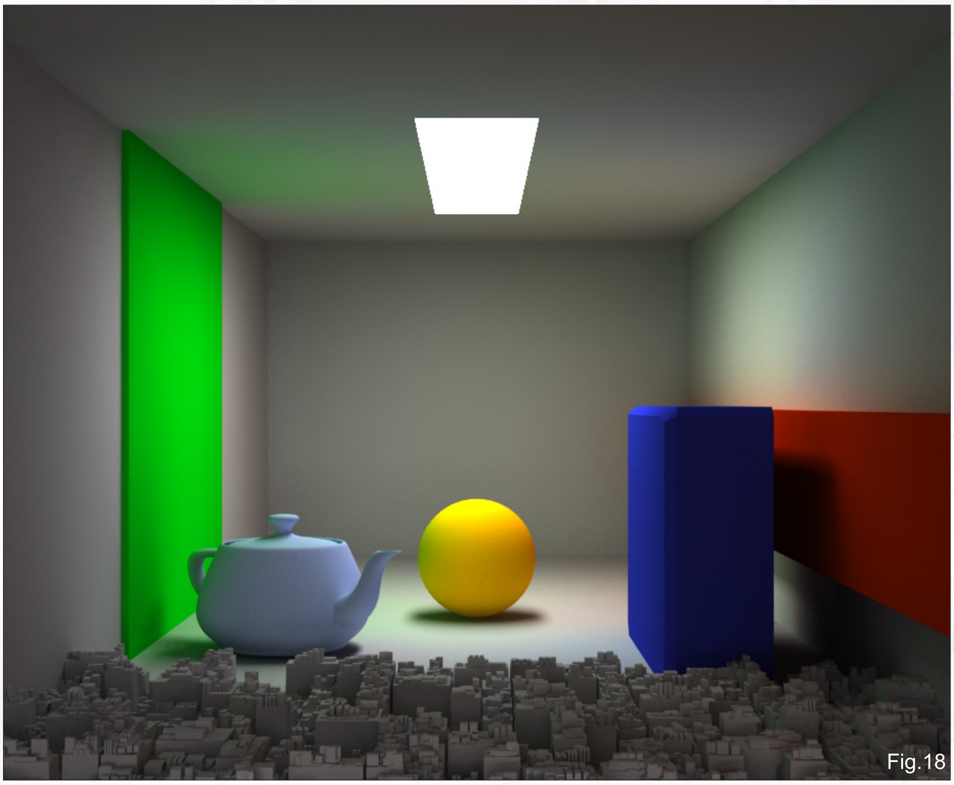


Fig.18

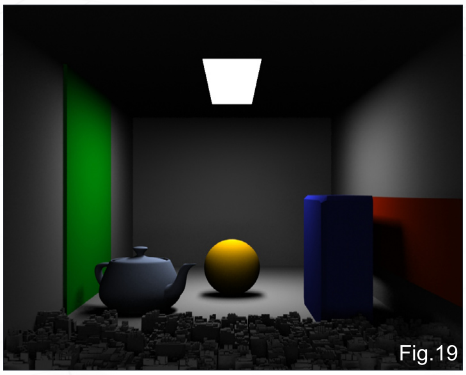


Fig.19

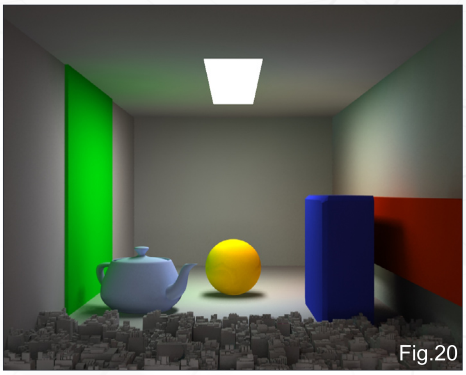


Fig.20

Brute Force

Self explanatory, this GI method will simply compute every light ray as soon as it hits an opaque surface at every possible angle, and restart again computing the resulting rays until it reaches the set number of bounces, resulting in very long render times. It is mainly used for the secondary bounces together with Irradiance Map as primary, but can also be used for primary bounces; if used as the primary GI solution, increase the Subdivisions to remove the noise. This method will usually be darker than IR Map + Light Cache.

Fig.23 IR Map + Brute Force for secondary GI – notice the overall darkness due to the 1 secondary bounce
Fig.24 IR Map + Brute Force – 3 secondary bounces
Fig.25 IR Map + Brute Force – 8 secondary bounces notice the high render time

You can also use Light Cache as your secondary engine to speed up the renders.

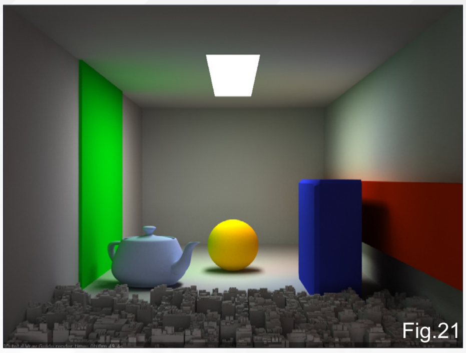


Fig.21

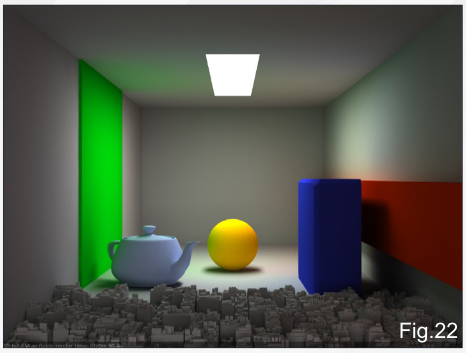


Fig.22

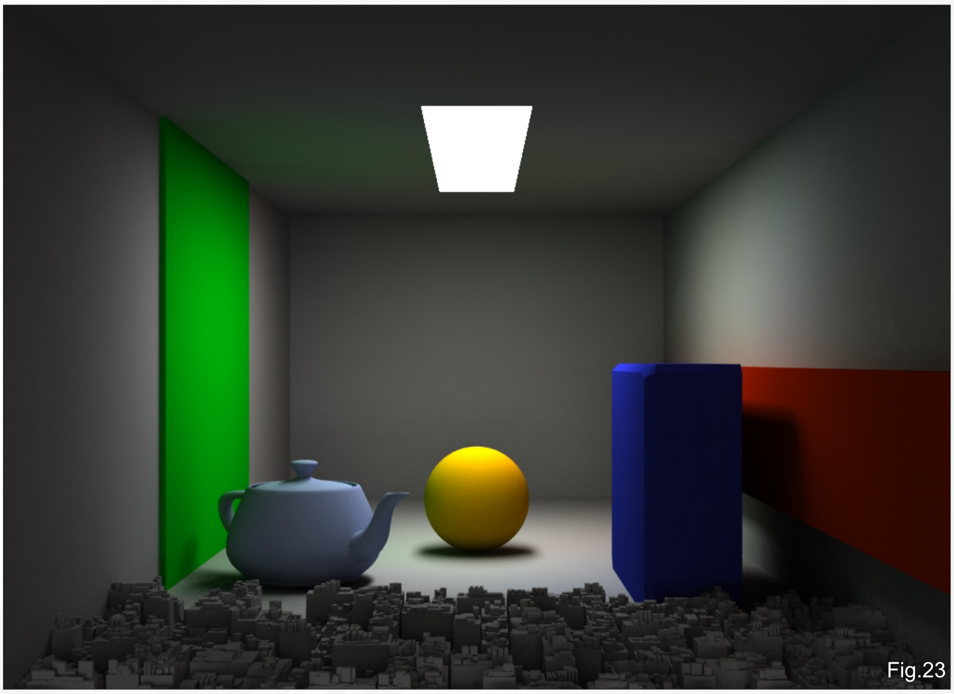


Fig.23

Light Cache

Light Cache can be used in addition to any GI solution as secondary bounces; it can also be used as a primary GI solution; it can make very fast previews; it works with animation and flythrough; and it can even make a final render by itself using the progressive path tracing – plus it's easy to use!

The main settings for Light Cache would be the subdivisions and sample size. You should keep in mind also that Light Cache is dependent on the final image resolution; if you multiply the final output resolution by two, you should do the same with the Light Cache samples.

This is a very good solution, in most situations. Its only drawback is that it doesn't work well with bump maps (go with displacement!).

Note: avoid full white materials (RGB 255, 255, 255) with Light Cache; as individual rays

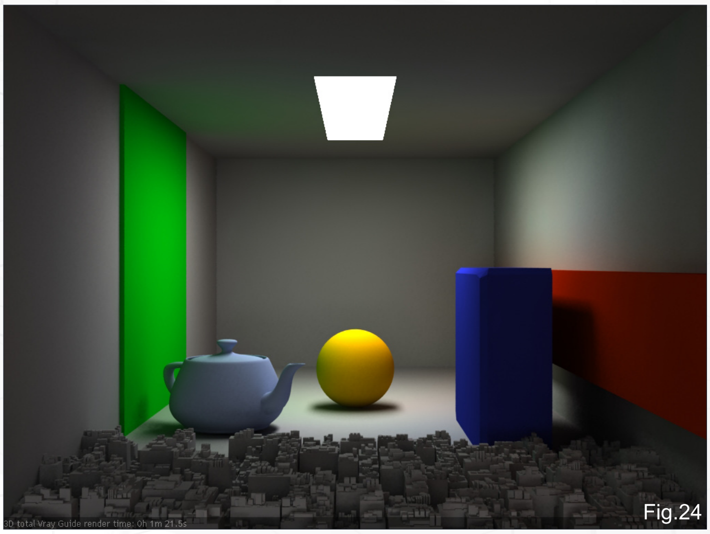


Fig.24

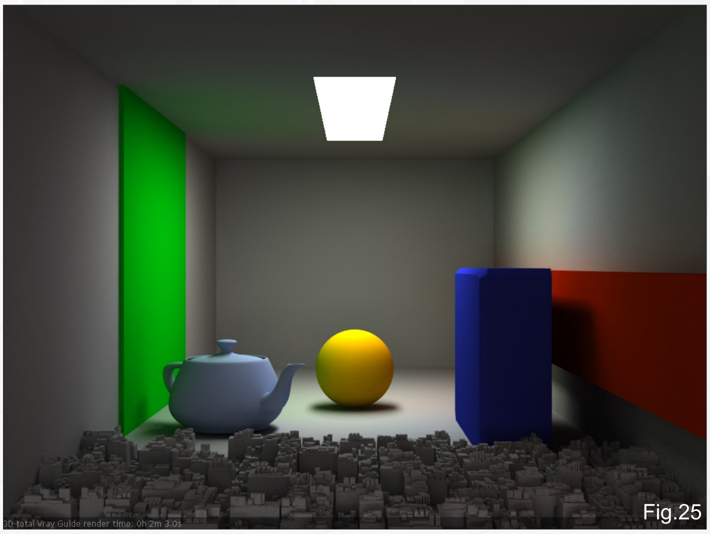


Fig.25

will take longer to dissipate, these will cause excessive render times.

Sample size: Increase to get better results.

Scale: This one can be tricky to get right at first as it is scene dependant; it determines the size of each individual sample that will be computed – a very low sample size will give a more accurate light cache while adding noise, but push it too high and you will lose detail. In screen mode, a value of 1.0 will mean the sample size will be the size of the final resolution; this mode is best for stills and most animations. In world mode, the sample size will be fixed to Max's unit system; that mode will put more details to objects close to the camera. This mode is suited for fly-throughs.

Number of Passes: If you have a Dual Core, set it to 2; 4 for Quad Core; 8 for Xeon owners, and so on.

Store Direct Light: Check this to let the Light Cache calculate direct lighting (this will blur the lights); uncheck if you want sharp lights – this can be useful if you have too many lights in your scene.


Fig.26

Adaptive Tracing: Reduces noise; useful with caustics.

Use Directions Only: Only available with Adaptive Tracing; gives a more accurate result. Strangely enough, this will add noise since it sharpens the Light Cache by adding more samples around fine details.

Pre filter: Increase value if too noisy, or too many artifacts.


Fig.27

Filter:

None: Good for previews.

Nearest: Good results.

Fixed: Best results; keep the filter size at least twice the size of the light cache samples.

Use Light Cache for glossy rays; this option will allow the Light Cache solution to compute glossy reflection and refraction, which can drastically speed up render times in certain cases.

Mode:

Progressive Path Tracing: This mode will let Light Cache render the final image; in order to get a smooth result you will need to increase the subdivision considerably.

Fly through: Very useful for flythrough animation for architectural scenes etc.; this will compute the Light Cache for the entire camera animation at the first frame, and will skip it for the rest of the render.

Single Frame: Basic rendering mode, to be used in most situations.

From File: Load a previously saved Light Cache to skip the calculation.

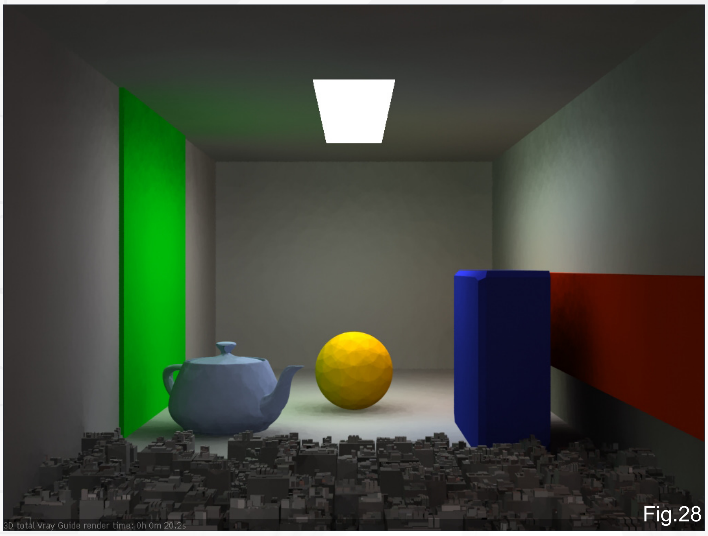


Fig.28

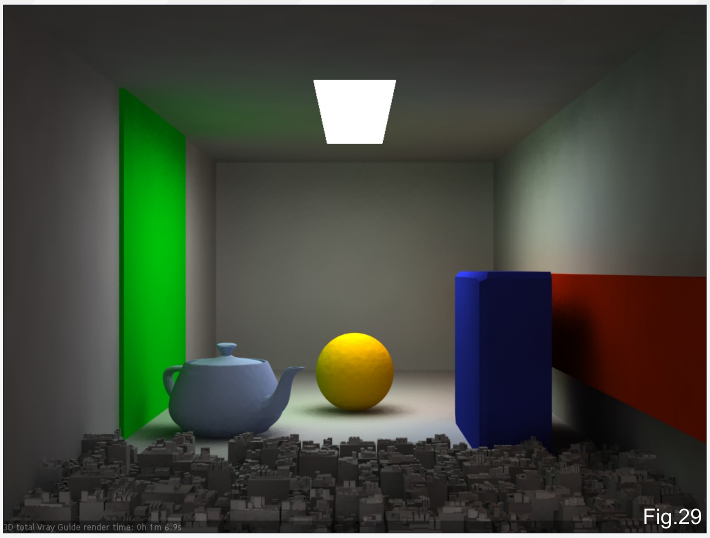


Fig.29

Fig.26 Light Cache only for GI – 50 samples, sample size 0.02

Fig.27 Light Cache only for GI – 250 samples, sample size 0.02

Fig.28 Light Cache only for GI – 500 samples, sample size 0.02

Fig.29 Light Cache only for GI – 1000 samples, sample size 0.01

Fig.30 Light Cache only for GI – 2000 samples, sample size 0.01

Fig.31 IR map + Light Cache only for GI – 1000 samples – the base for a great GI solution!

Photon Map

A decent solution for previews, due to the fact that it generates the GI for the entire scene, when compared to just the camera angle; however, it's very inaccurate, it only works with Vray materials, and does not support environment lighting.

It can be used as a primary GI engine, but is much slower than other solutions; Photon Mapping is viable as a Secondary GI solution with Irradiance Map.

Bounces: Increase for better image quality, but this increases render times.

Auto Search Distance: Will let V-Ray calculate the search distance to use; it can be checked most of the time, but results should be better by taking time and experimenting with it.

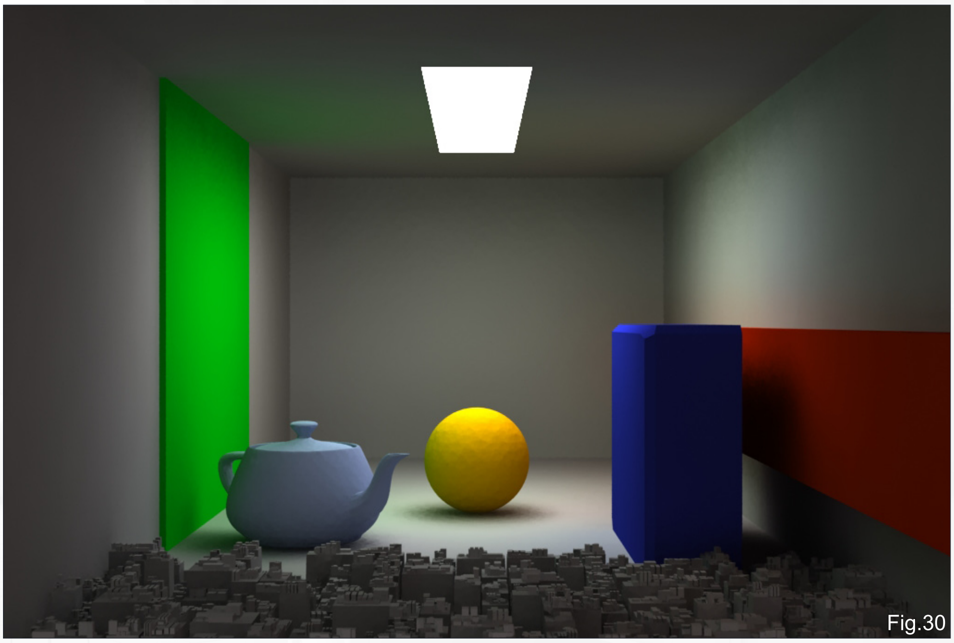


Fig.30

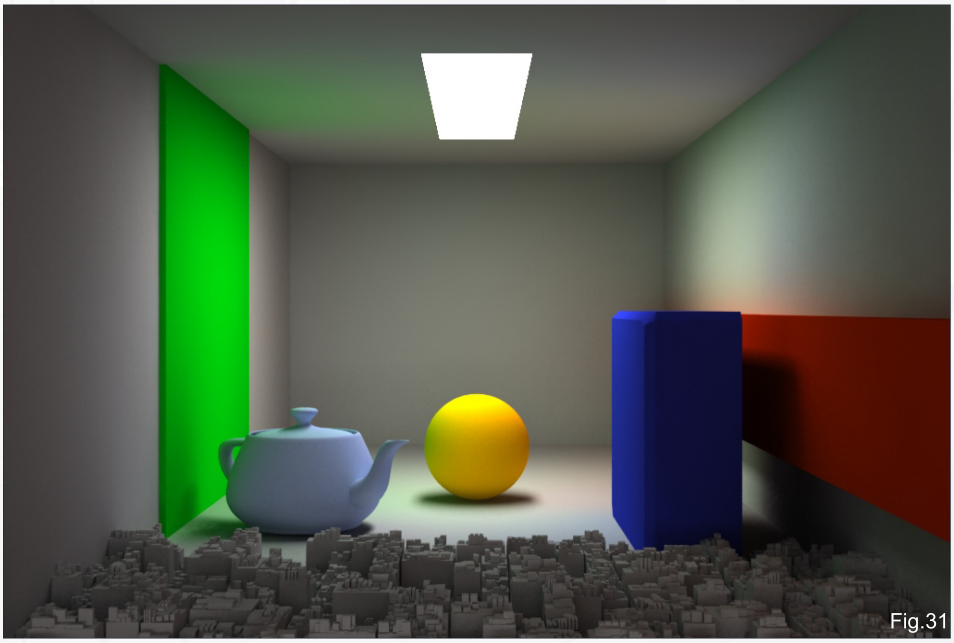


Fig.31

Search Distance: Lets you control the search distance: reduce to render faster with a high amount of noise; increase for the opposite reaction.

Max Photons: Set to 0 to use all available photons.

Max Density: Limits the memory usage of the Photon Map.

Convert to Irradiance Map: Converts the Photon Map to an Irradiance Map; this is not the same as Irradiance Map, this will render faster than a standard Photon Map.

Inter Samples: Same setting as in Irradiance Mapping.

Convex Hull Area Estimate: Check this if you have issues with dark corners; it will slow down rendering.

Store Direct Light: Self explanatory!

Retrace Threshold: If above 0.0, this will add Brute Force GI solution for fine details; it will be slower and might be noisier.

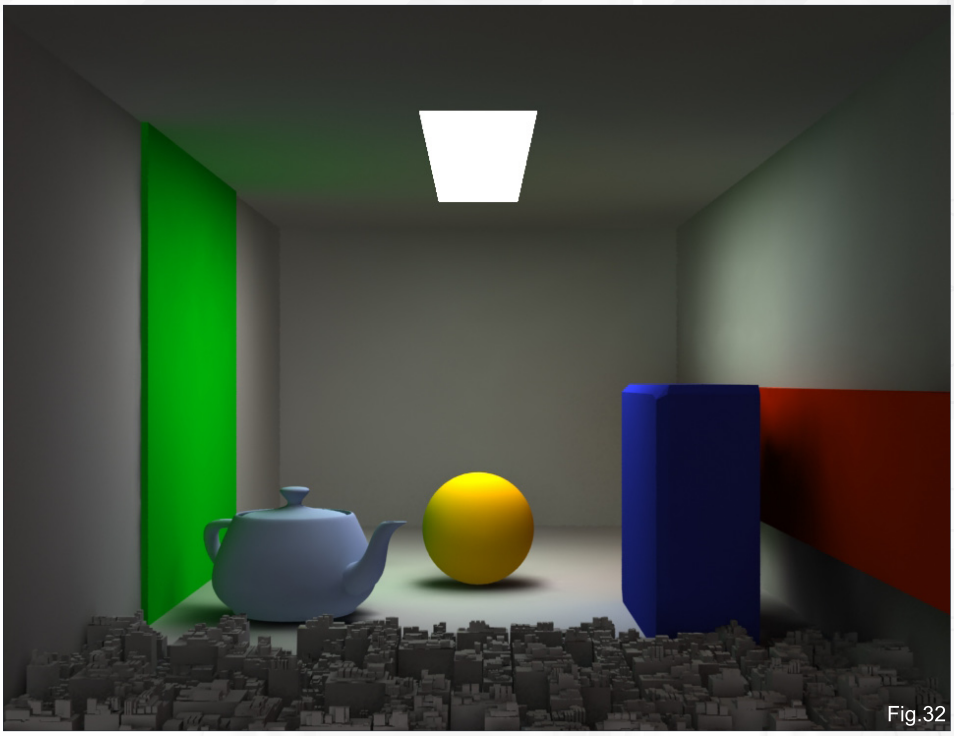


Fig.32

Retrace Bounces: Similar to Brute Force bounces, it only affects if the Retrace Threshold is greater than 0.0.

Fig.32 IR Map + Photon Map – some incorrect results, and quite a long render time

Fig.33 IR Map + Photon Map converted to Irradiance Map – same results but much faster render

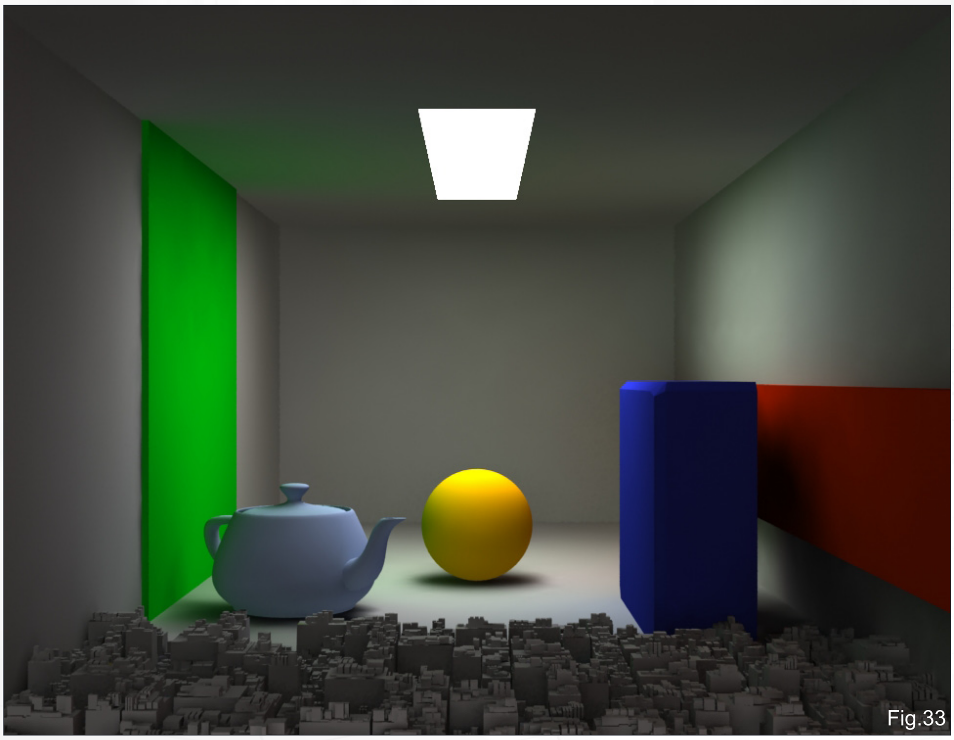


Fig.33

I usually stick with Light Cache and/or Irradiance Map; Brute Force can be used, but get ready for a long wait if you don't like noise!

How To

Create Ambient Occlusion

In the Global Switches tab, check Override Mtl and plug in a VRayDirt Map. This will replace all of the scene materials during the render as the one plugged (more details to follow in **Chapter 2: Materials**).

Use Progressive Path Tracing

Select Light Cache for both primary and secondary bounces in the GI settings; select the mode, Progressive Path Tracing.

Check Show Calc. Phase

Set the Subdivs to 2000 and the sample size to 0.01, and hit render (**Fig.34**).

You will see the scene build up and noise gradually decreasing; however, there are not enough subdivisions to make a smooth image, so to fix this just add more samples.

Set the Subdivs to 4000; this will multiply the render time by 4 (**Fig.35**).

Still noisy along with an increasingly high render time; if you want it smoother, keep adding samples. One way to do this is to set the samples to 20,000 – 100,000 and cancel the render whenever you wish. This will keep the image you see on the screen as the final render.

Note: you can save the Light Cache generated by Progressive Path Tracing and reuse it for standard IR Map + Light Cache renders.

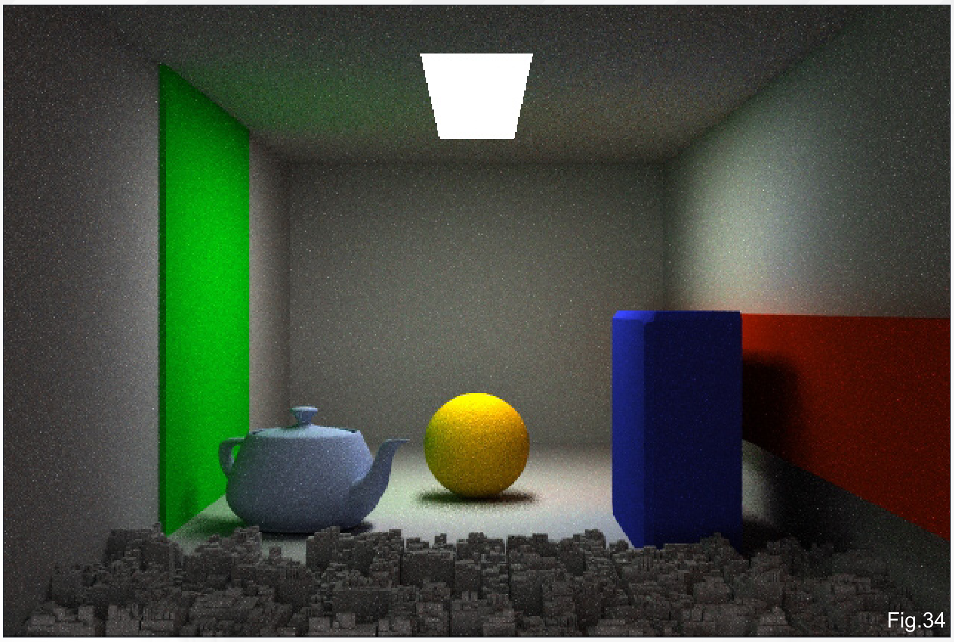


Fig.34

Make GI Previews

With IR Maps

Set the IR Map to the medium preset, then set it to custom; set the Max rate to -7 and the Min rate to -4; set Light Cache as secondary engine and set the number of samples to 250 with a sample size of 0.08. Hit render.

Fig.36 = 6 seconds, and a decent approximation of your scene! You can increase accuracy of the GI by pushing the Light Cache samples a bit, and/or the Min rate.

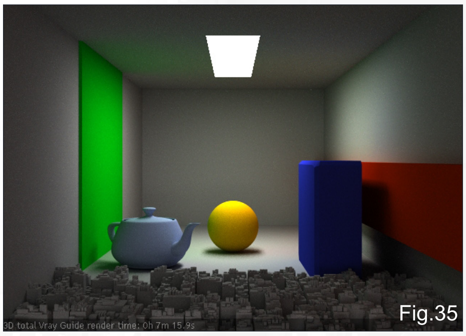


Fig.35

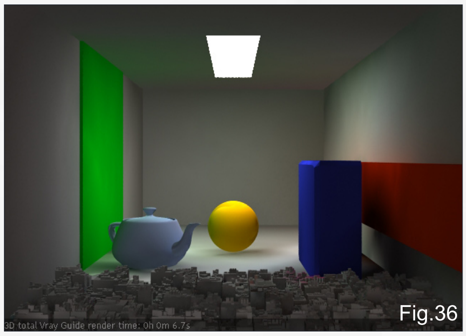
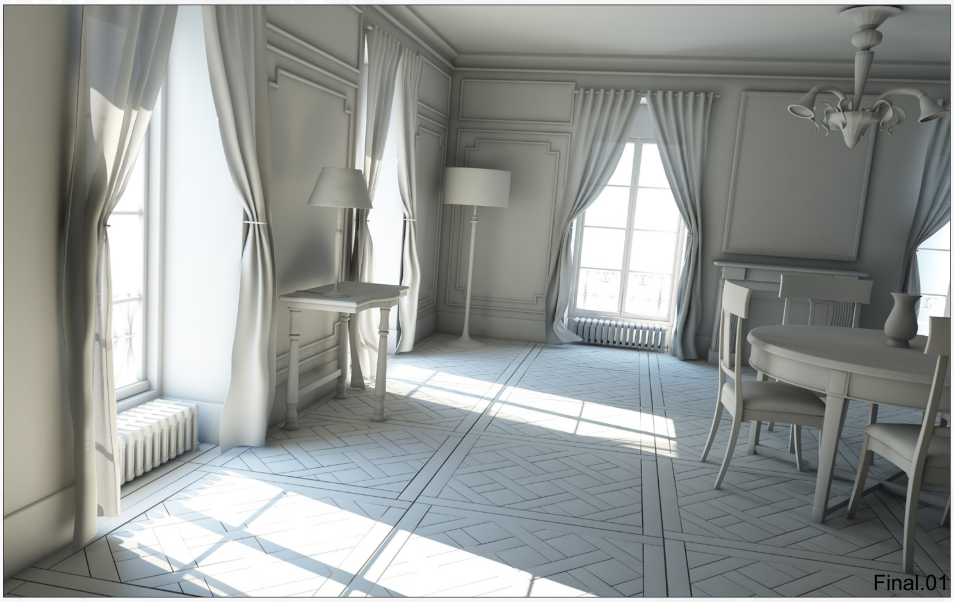


Fig.36

With Light Cache

You can use Progressive Path Tracing, but this will be noisy, so just set Light Cache as primary and secondary engine, set the sample to 500-1000, and set the sample size to 0.02. Hit render.

See light cache example above (**Fig.29**).



Final.01

Lighting a Scene with only GI

Now let's tackle a more complicated scene with only sunlight and environment lighting the scene. Let's see what the best way to preview,

Fig.37

light and render this scene is, without losing fine details or suffering (not too) long render times (**Final.01**).

The only light source in this scene is a VRaySun, with a V-Ray environmental lighting linked to the sun. Since light will only come in through the windows, this will create a few problems, as direct light will only hit on a small portion of the floor.

Fig.37: Direct light only

Find the Right Solution for your Scene

Fig.38: Irradiance Map + Brute Force GI, set as very low preset – already a four minute render! Let's try this with Light Cache as secondary bounces…

Fig.39: Irradiance Map + Light Cache, same settings for the Irradiance Map, Light Cache at 1000 samples – rendered in 2:30. This is better, but obviously not enough detail in the GI solution, so let's push those settings up!

Fig.40: This time Light Cache Subdivisions are at 2000 and the Irradiance Map settings are on high. A 15-minute render and the render quality is far from perfect; you can see blotchy spots on the wall and ceiling, fine details and corners have a great deal of noise, and you can't see all the floor tiles. The solution for this will again increase render times: we simply need more hemispherical samples; these will add more rays shooting from direct light bounces. Let's set them to 100, increase the Interpolation Samples to 30, and reduce the Min and Max rate to -4 or -1. This time you can keep the Light Cache already computed, as only the Irradiance Map needs to be calculated again.


Fig.38


Fig.39


Fig.40


Fig.41

Fig.41: Now that's much better – you can see a big difference on the left wall and curtain! However, further away from the camera, blotchiness is still ruining the render – same problems on the floor. This time, let's rework on the Light Cache: go back to single frame on Light Cache with 0.003 sample size and 3000 samples; in Irradiance Map set the Interpolation Samples to 50, and the Calc. Pass Interpolation to 15. For better details increase the Color Threshold to 0.4, and finally the Normal Threshold to 0.2.

Fig.42: Completed in 20 minutes and at a decent quality, but not yet production. At this point, several options are viable: you can simply just increase the Max rate to keep tweaking the Hemispherical Subdivision; increase the Interpolation Samples … Lots of tweaking is

possible! On the other hand, you could rely on an Ambient Occlusion pass to sharpen the fine shadows.

If you have a need for a very high resolution render, a good solution is to compute the GI at half of the final resolution, save it, and then render at full resolution. This will drastically speed up the render! The image improvement from computing GI at 5000 pixels wide compared to 2500 pixels is almost invisible. If you absolutely need more details, the wise choice would be to make an Ambient Occlusion pass at full resolution and merge it with the final image (**Final.01**).


Fig.42

Conclusion

There, we have tackled most of V-Ray's Indirect Illumination settings and finer workings; you now have the tools to light your creations in many different ways, depending on what you need most – accuracy, speed, stills, animation, SD images, and high-res images. The only advice I can make at this point is to take some time experimenting with V-Ray: play around with the settings, see how they affect the render itself, the memory usage, and the render time – this can really help once you use V-Ray to render that multimillion poly scene, with a multi-layer, glossy Fresnel refraction and SSS material all over the place!

I personally usually stick with Irradiance Map + Light Cache and add Ambient Occlusion for a basic render. The interpolation types' sample sizes, as well as most other settings, always need more or less tweaking depending on the complexity of the scene. For previews I use a low sample Light Cache.

If you're used to overnight renders you can take advantage of Progressive Path Tracing – let it run while you are away at the weekends!

Don't forget that Irradiance Map and light cache are dependent on the image resolution: a GI solution for 640*480 will not be suitable once you render it at 1920*1200; to speed up tweaking find the tricky parts and use render region.

Be sure to catch the next chapter in this series where we'll be looking at Vray Materials!

Eric Ennis

For more from this artist visit
http://www.Eric-Ennis.com
or contact
contact@eric-ennis.com


3D Total V-Ray Series | render time: 0h 43m 34.1s


Final.01


3d02.COM

The Finest 3d Model Store

3d02.com. Commonly known as a high quality 3d model store, one of the premier stores of digital assets offering ready to use CG 3d models, and an open platform allowing artists to publish and sell their 3d models online


3DTotal presents the new issue of 2DARTIST magazine: a downloadable monthly magazine for concept art, digital & matte painting for only £2.75 (approx $3.78 - €2.93)

visit WWW.2DARTISTMAG.COM to download the free 'lite' issue, the full issue, subscription offers and to purchase back issues.

2D ARTIST

"All of the architectural forms and details will be extracted from the cathedral itself and after being deconstructed shall be reassembled to assume a new design, rather like building with Lego if you like."

Creating a FANTASY scene

Using 3D, Photography and Post Production | Chapter 2

Using 3ds Max and Photoshop, we'll be teaching you how to create a fantasy scene inspired by real-world architecture, and how to correctly and effectively use reference photos of your chosen source of inspiration to get stunning effects quickly and easily! This month we're tackling the photography and concept stage in preparation for the 3ds Max work coming in the next issue. Read on to join Richard Tilbury for the first chapter of the 5-part series.

This Issue :

A general overview of modeling and lighting the 3D scene based upon concept. We will look at what to model and what to leave out, focusing on main volumes and key forms that are best done in 3D and how this technique can aid with perspective and lighting.

Chapter 1 | November 2009 Issue 51
Chapter 2 | December 2009 Issue 52
Chapter 3 | January 2010 Issue 53
Chapter 4 | February 2010 Issue 54
Chapter 5 | March 2010 Issue 55

Creating a Fantasy Scene Using 3D, Photography and Post Production: Chapter 2

Software Used: 3ds Max and Photoshop

Introduction

During the course of this tutorial we will build a fictional scene inspired by an existing location, in this case a cathedral. The building itself will dictate the style of architecture used throughout and will essentially be reorganized into a different structure altogether. All of the architectural forms and details will be extracted from the cathedral itself and after being deconstructed shall be reassembled to assume a new design, rather like building with Lego if you like.

The building will then be placed into an imaginary environment and will start its life cycle as a 3D model built inside 3dStudio Max. Our 3D package will be used to create the lighting and perspective as well as setting the camera position / viewing angle. Photographs taken of the site will then be used to create rudimentary textures used to map the building. 3DTotals free library of reference photographs (http://freetextures.3dtotal.com) will be used to construct the scenery in a way akin to matte painting as well as add finer details to the building model. The final stage of the tutorial process will involve revisiting the location in order to photograph certain parts of the cathedral from specific angles to match the perspective in our scene. These photographs will then be edited and used to add extra detail and further refine our image.

Fig.01

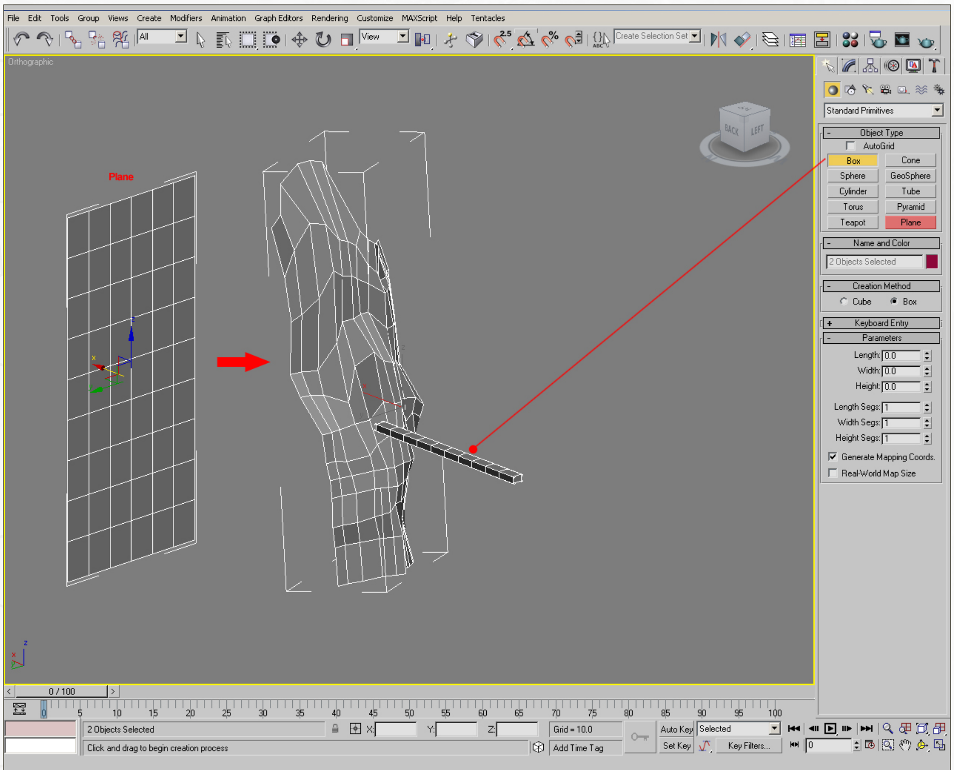


Fig.02

Building the 3D Elements

This chapter will be an overview of the modeling phase of the tutorial and will concern the general principles that are common to most 3D packages. It shall feature 3ds Max as the example software but as opposed to detailing a step by step approach, we will focus on an overall approach using techniques that are equally applicable within other packages.

The first stage involves looking at the concept and trying to break it down into its key components. In **Fig.01** you can see I have drawn over the top of the image to show how some of the components can be reduced to simple geometric forms. This process of interpreting the scene is quite straight forward as the design is already very simple.

The main building is essentially a rectangular shape with a simple box and triangle used to form the bridge and canopy. The rock face appears to be possibly the most complex aspect but this could be reduced to an angled plane with some small deviation. Once a part of the scene is built we can establish a camera position and then reproduce a similar perspective and eye level in the 3D scene as this will form the basis of our composition and final render.

In **Fig.02** you can see that the bridge itself has been made from a box and the rock face from a Plane as indicated in red in the panel. This plane was then converted into an Editable Poly, subdivided and then manipulated to resemble a more natural surface.

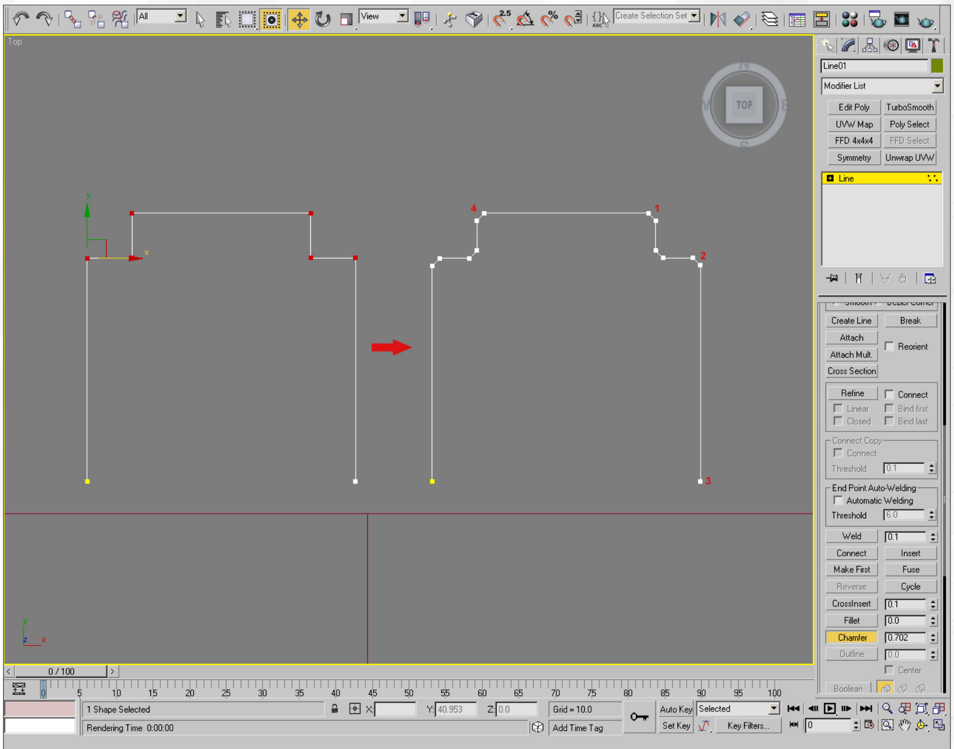


Fig.03

Apart from perhaps the building set into this rock face, the main 3D components will be the two supporting columns and so it makes sense to create these in order to help establish the eyelevel and camera angle.

These are made up of four identical sections that form a cross shape when seen in plan and so we can make a single section that can then be duplicated three times to form the entire cross section. The best way to do this is by using Splines.

In an Orthographic view I started by creating a shape seen on the left in **Fig.03** – the yellow vertex being the first one in the sequence. It is helpful to use Snaps in order to keep the points aligned whilst doing this. Once done I then selected the vertices highlighted in red and applied a Chamfer, highlighted in the right panel. This adds a new vertex beside those selected and results in a smoother transition through the six corners.

Fig.04

The four numbered corners correspond to those indicated in **Fig.04** on the section of the cathedral column photo (http://freetextures.3dtotal.com/preview.php?imi=12233&s=c:Church&p=6&cid=3).

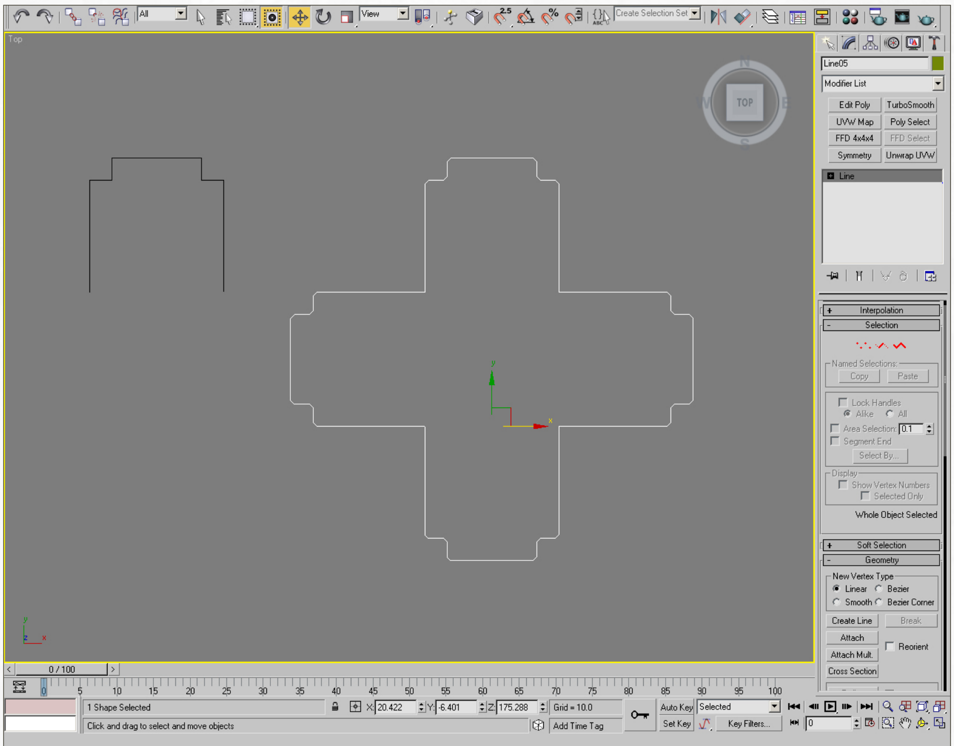


Fig.05

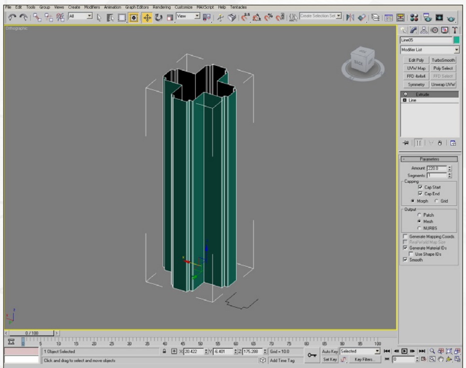


Fig.06

This quarter of the column can then be duplicated three times and then each of the four pieces can be attached to form the entire shape as seen on the right in **Fig.05**.

The next step is to apply an Extrude modifier and create a three dimensional object from the Spline shape (**Fig.06**).

This amount can be reduced in order to form a quarter of the columns height (see red section in **Fig.07**). The reason for doing this is that we can then map a small section of the entire object. This section can then be duplicated and hence minimizes the amount of texture space necessary as each part will occupy the same UVW co-ordinates.

On the right you can see the piece has been multiplied to form the four modular sections. The bottom row of edges can be Chamfered and then the extra group of Poly's Beveled to form the cross sections that join each piece. Two subdivisions have been added to piece 3 and then the verts pulled out to mimic the concept sketch.

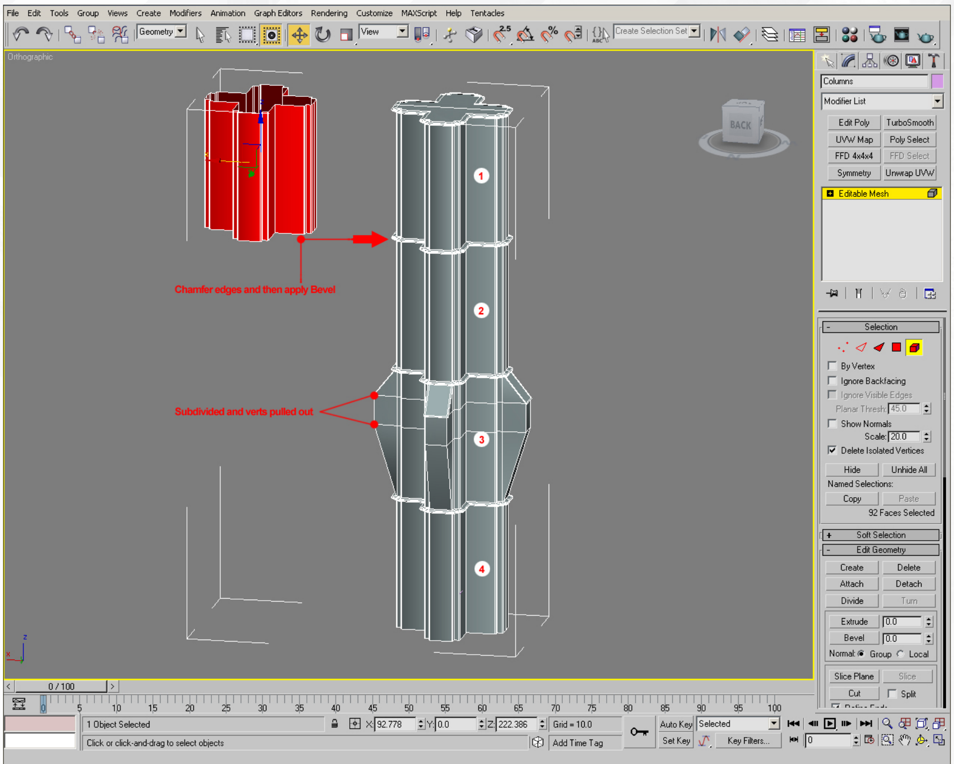


Fig.07

Once done this column can be copied to create the second one and then both placed below the bridge. With these two elements now in place we can add a camera and roughly match the angle in the concept.

In **Fig.08** you can see the position of the camera relative to the geometry and the eventual camera view in the bottom right viewport. The main building can be started from a Box and then once converted into an Editable Poly, subdivided and then the verts moved and polygons extruded to form the various components (**Fig.09**). The section shown in blue was modeled as a separate mesh and then attached to the main building.

To create the arched feature that extends from the highlighted poly it is possible to create a curved Spline (one quarter of a circle in this case) and then use the Extrude Along Spline function.

The Spline is placed in front of the appropriate face and then once the arch is extruded you can then align the outer edge of verts/faces in order to create a 90 degree angle, thus resembling the structure seen in the photograph (**Fig.10** - http://freetextures.3dtotal.com/preview.php?imi=12239&s=c:Church&p=7&cid=3).

The concept sketch shows a doorway set into the side of a rock face in the foreground and

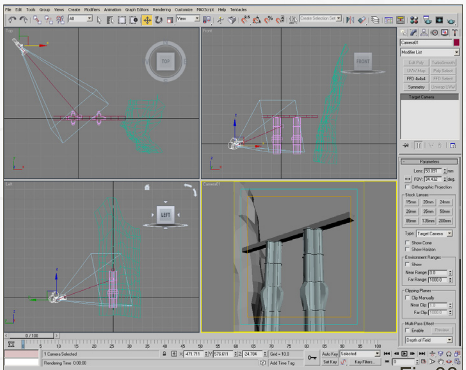


Fig.08

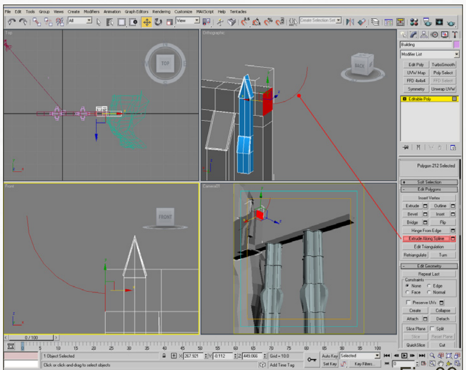


Fig.09

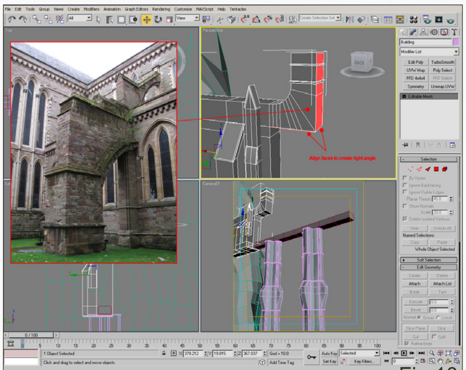


Fig.10

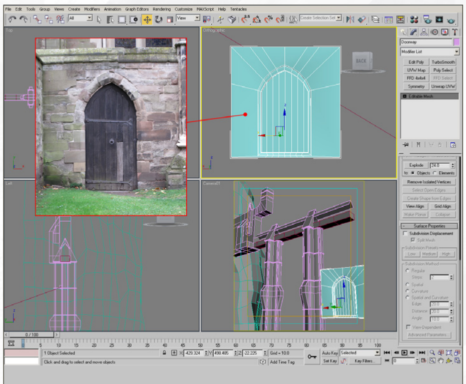


Fig.11

having looked through the photos I decided to use the door seen in **Fig.11**.

When you find a perfect image / texture this can be the driving force behind the geometry and in this case I modeled the door based upon the photo (inset). I decided it was a little slim and so exaggerated the width slightly but still within the limitations of the photo.

The best way to create this is to start with a simple box that will be used to model one half of the doorway (**Fig.12** (a). I then selected the outer edge of poly's except those on the extreme right and extruded them (b). The extra poly's were then aligned to create a right angled shape (c). The edges highlighted in red were then chamfered to create the door surround. The geometry can then be mirrored to form the complete door as seen on the far left.

When it comes to the mapping I can simply project this image onto the geometry and with a small amount of scaling it will fit accurately. Even though the rock faces will probably be composed within Photoshop using photos it is useful to model a rudimentary version to help get an idea about their formation and how light may react with them. As a provisional solution I modeled three separate sections of rock using a Plane as a starting point (**Fig.13**). I then applied a Noise modifier to rupture their uniformity and create some randomness and then manipulated the verts to refine the shape.

These three meshes are crude but will give me a good idea about how the rock formations will look and therefore act as a guide when choosing the photos.

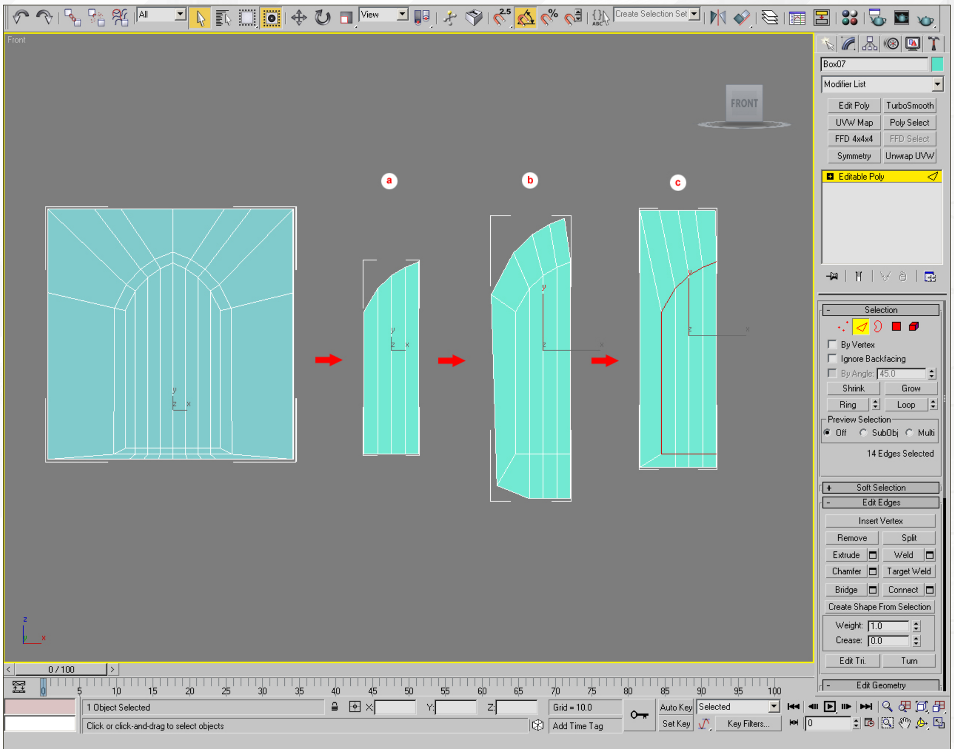


Fig.12

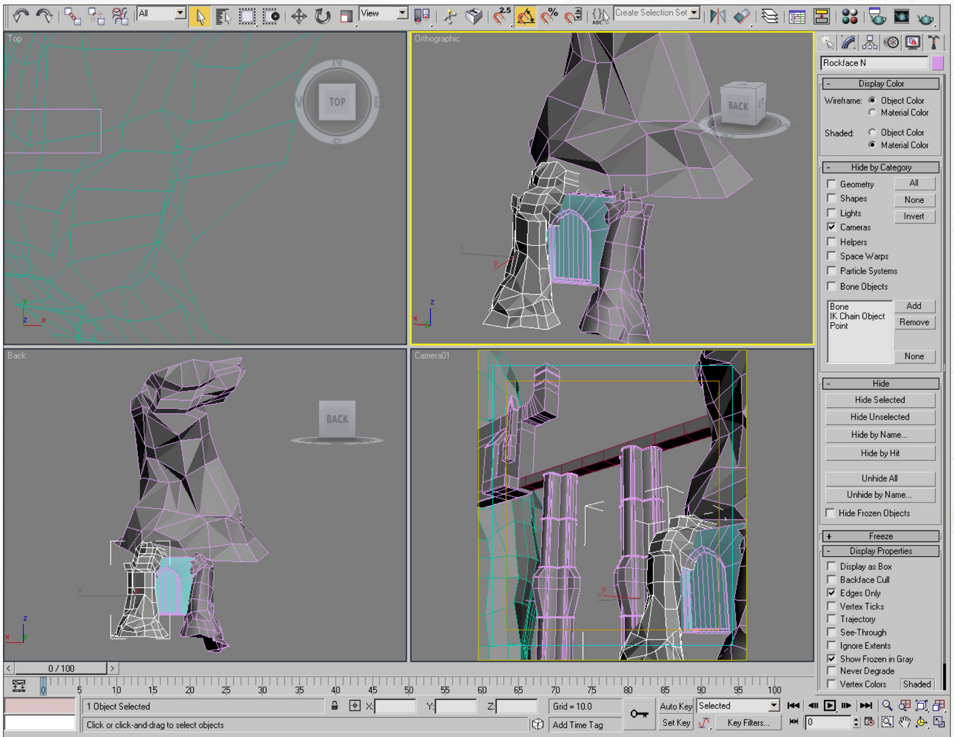


Fig.13

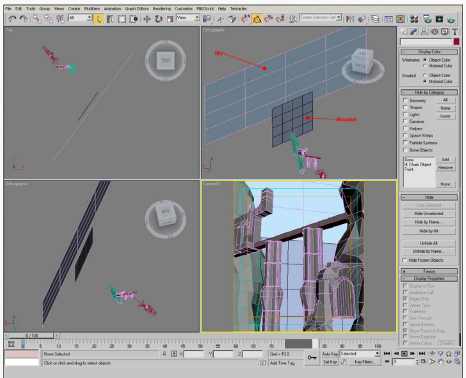


Fig.14

The Background

The scene is coming together now but one of the key aspects which is yet to be resolved is the background. As this is far from the camera, the best approach will be to find suitable backdrops, in this case using the free library of photos available at 3DTotal (http://freetextures.3dtotal.com) and then simply map these onto a flat plane positioned behind the scene (**Fig.14**).

Here you can see two large planes that correspond to the sky and mountain range that will eventually appear in the distance behind the rock faces.

For the sky I decided upon the following image from the free library which can be seen mapped onto the distant plane in **Fig.15** (http://freetextures.3dtotal.com/preview.php?imi=8531&s=c:Skies&p=4&cid=17).

If you wish to brighten the image you can make the material self illuminated or alternatively alter the values in Photoshop using Curves, Brightness/Contrast etc.

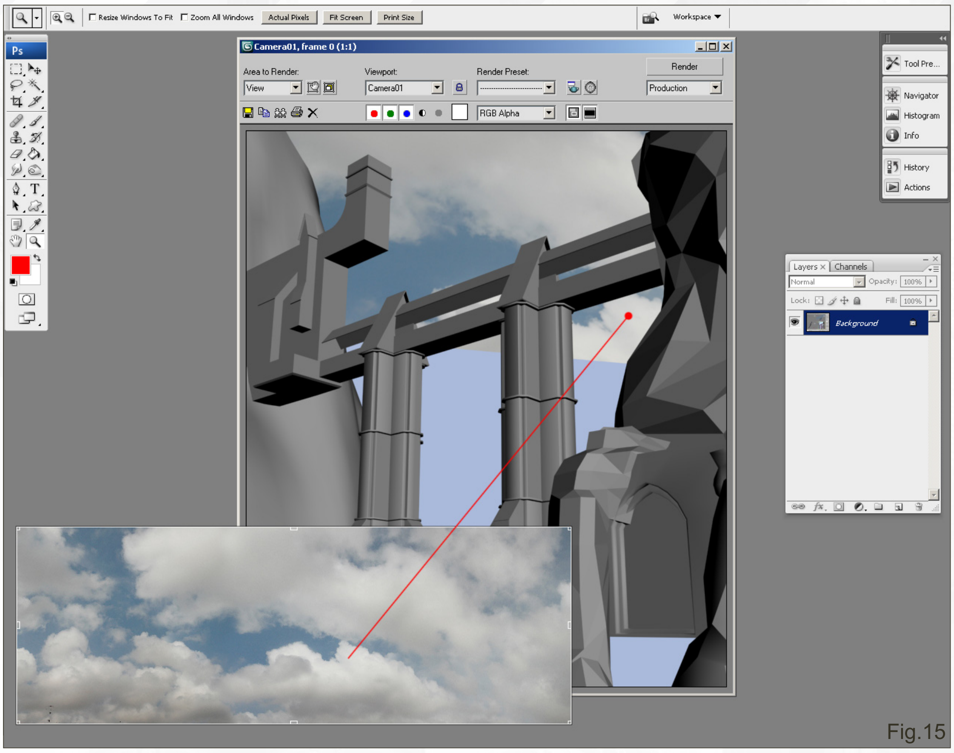


Fig.15

The sky can be mapped onto the plane using only the Diffuse map channel but the mountain range which is in front of this will require an Opacity map. If we look at an example image in **Fig.16** we can see that the mountain itself is ok but we can make out the top edge of the plane which looks wholly inappropriate (http://freetextures.3dtotal.com/preview.php?imi=6238&s=c:Environment_Mountains&p=0&cid=13).

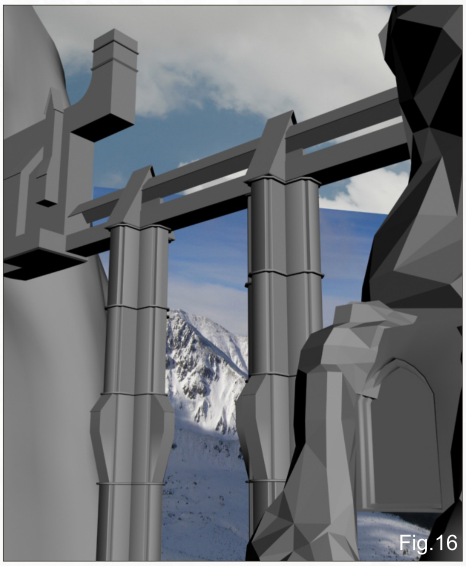


Fig.16

We need an image with an alpha channel whereby white represents an opaque or visible region of the map and black determines a transparent area (**Fig.17**).

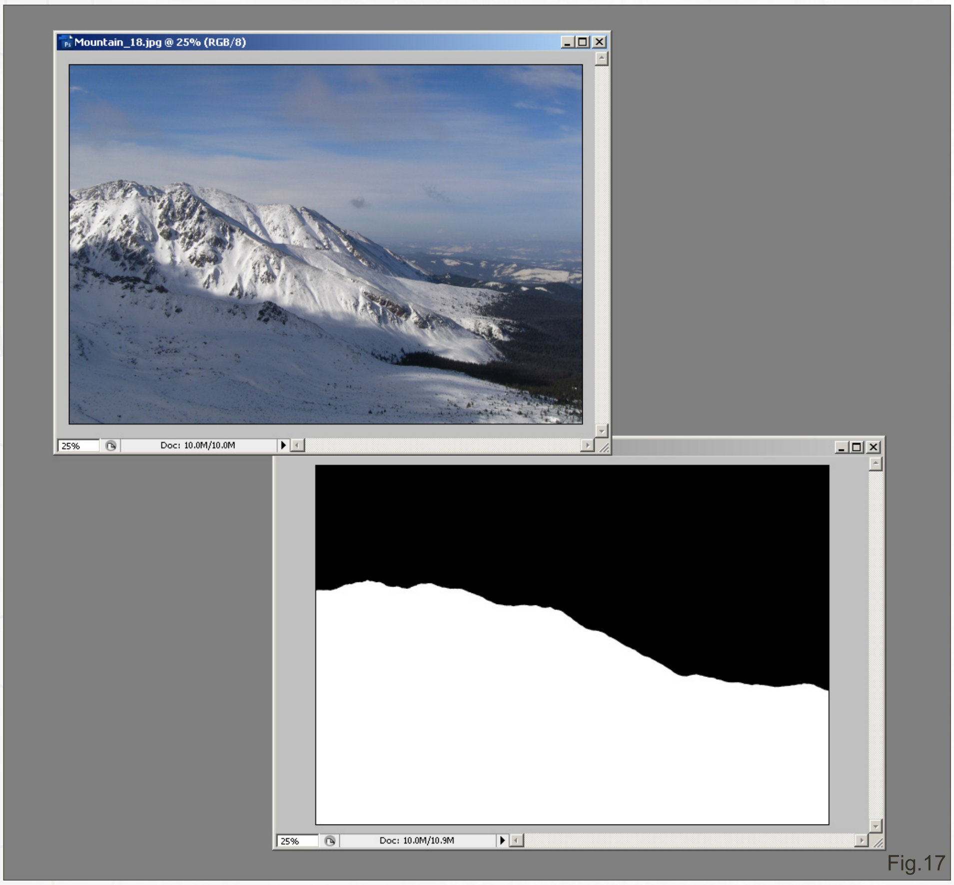


Fig.17

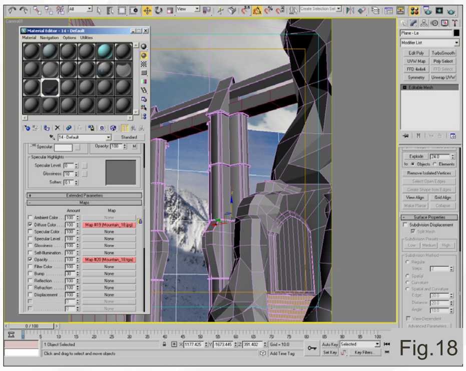


Fig.18

In **Fig.18** you will notice in the Material Editor that the JPEG in the upper left of **Fig.17** has been assigned as the Diffuse map and the tga file that carries the alpha channel has been assigned to the Opacity slot.

When the scene is rendered we now see that the alpha channel disguises the sky and reveals only the mountain, making the background look far more authentic (**Fig.19**).

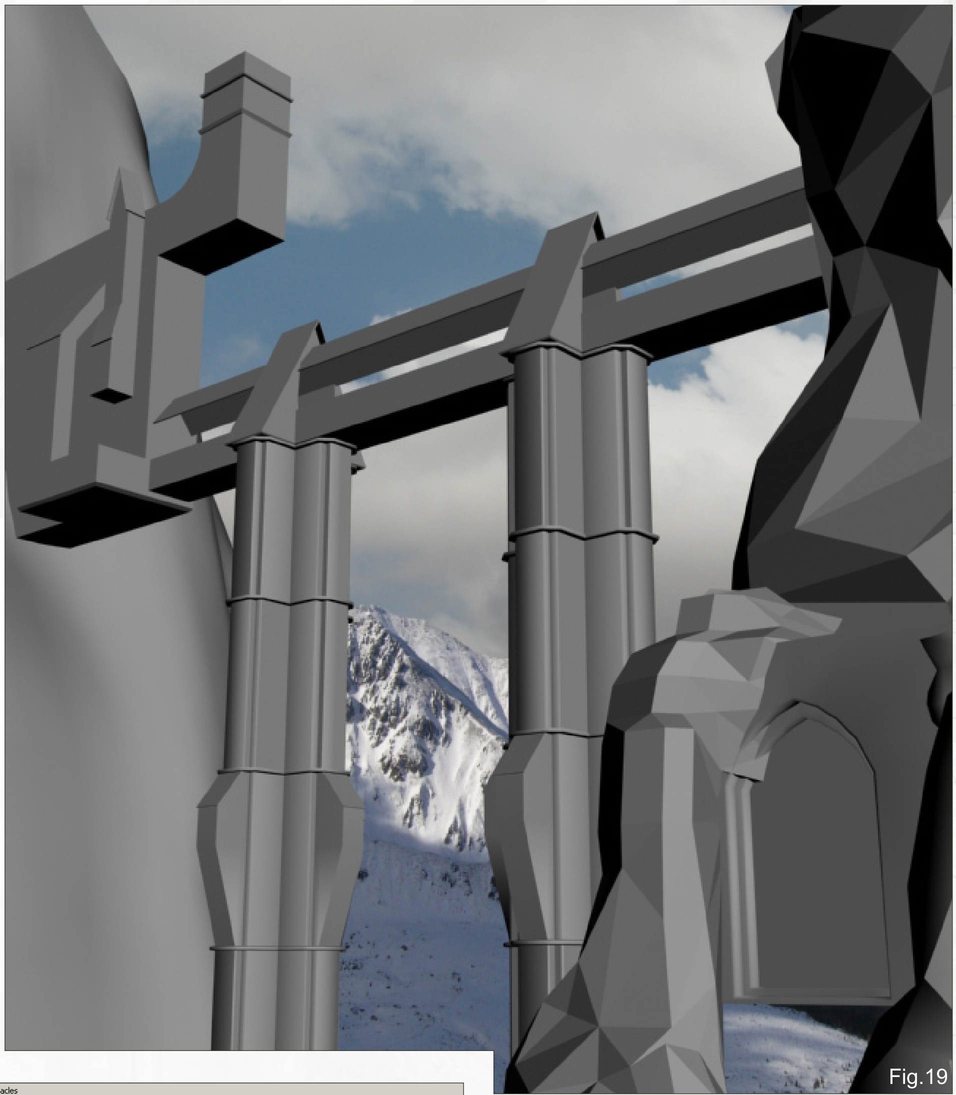


Fig.19

Lighting

So far we have focused purely on the modeling phase of the scene but one very helpful aspect of working in 3D is the inclusion of lights. The main light source in the concept piece is somewhere in the upper right of the picture behind the buildings so I will initially place a Directional Light with Ray Traced Shadows in a similar position (**Fig.20**).

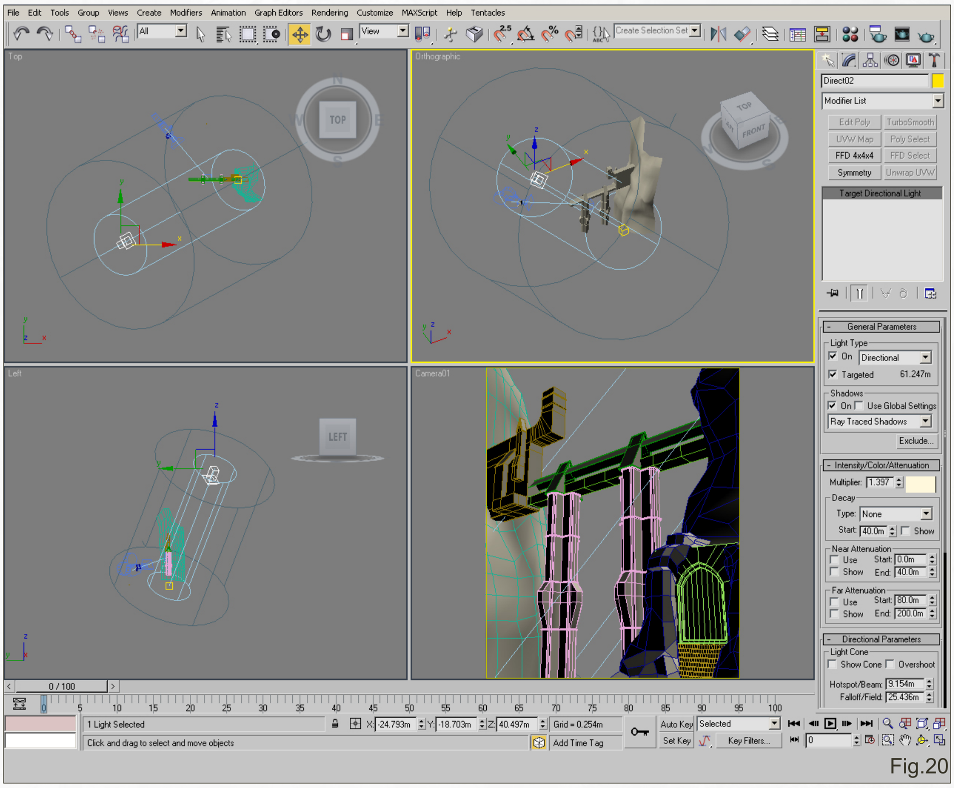


Fig.20

When the scene is rendered out it looks like **Fig.21**. As you can see the Ray Traced Shadows react accurately to the scene but overall everything looks very dark, with the near doorway hidden in silhouette.

To help add some ambient light into the shadows I add a Skylight which softens the scene and also adds some much needed Global illumination in the shaded areas, especially the foreground (**Fig.22**).

The render looks far more like the concept now but the nearside of the building is exclusively in shadow and the direction of the light does


Fig.21

not really do this or the columns justice. As an alternative I moved the light to the opposite side of the scene (**Fig.23**).

This rendered the foreground somewhat lighter than I desired but as much of this would be built from photos it was not a problem as the values could be controlled in Photoshop.

When compositing an image together in Photoshop based upon a 3D scene it is helpful to have numerous passes in order to have more control. As this scene will partly be built from photographs there is no real need for the common number of 3D passes but one that will prove useful is Ambient Occlusion.

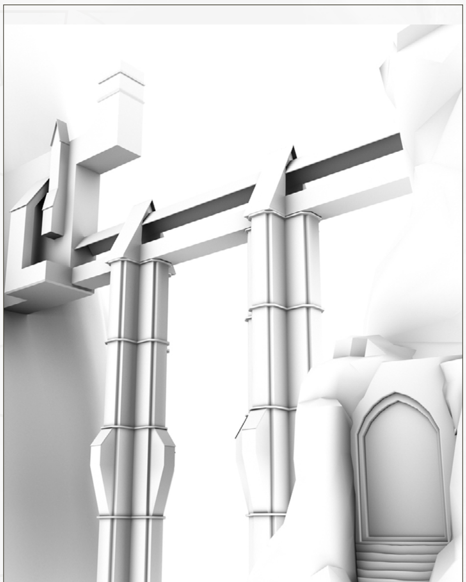


Fig.24

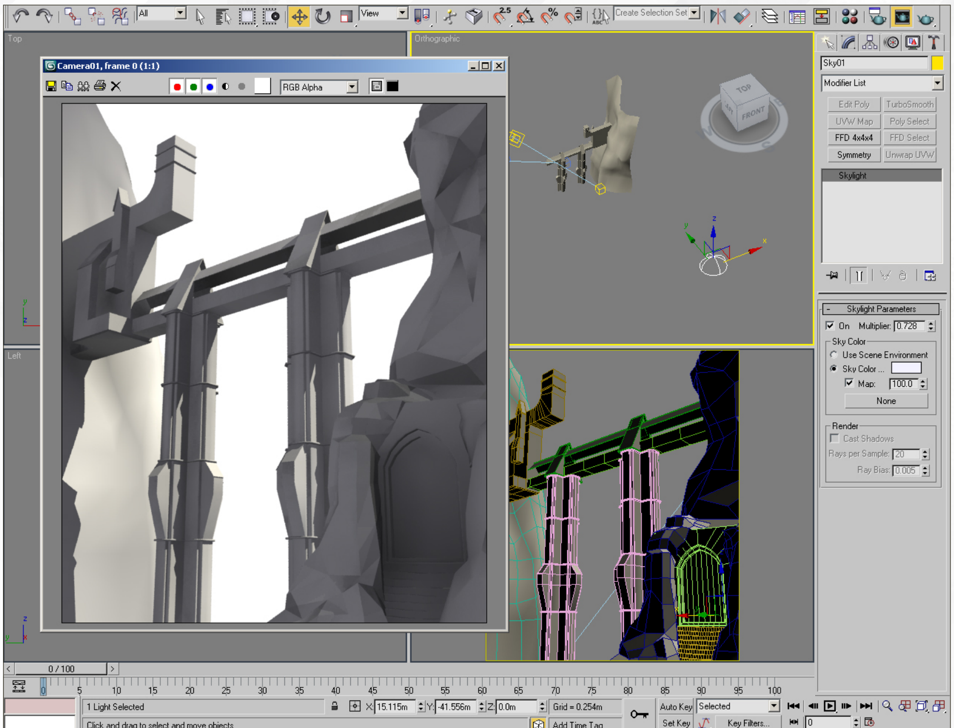


Fig.22

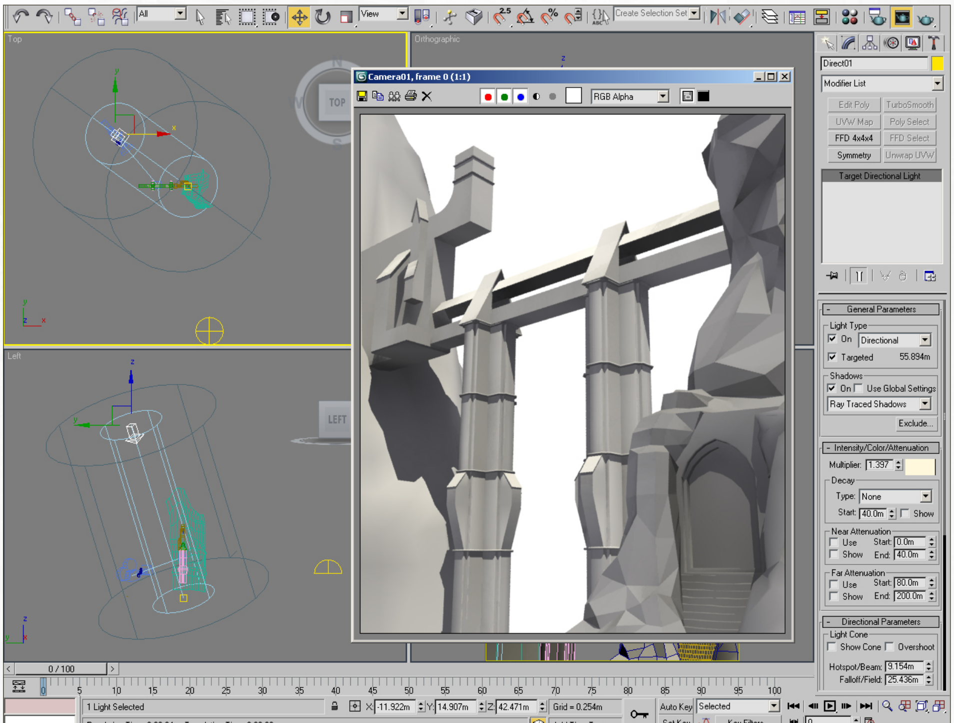


Fig.23

Fig.23 shows this pass which emulates global illumination and calculates which areas would receive less light. This render pass can be placed over the final textured scene and help add some soft shadows and depth to the scene.

Next month we will cover some of the methods used to create texture templates from the library of photos and see how these can be applied to the 3D scene as a starting point for further refinement.

RICHARD TILBURY

For more from this artist visit
http://www.richardtilburyart.com/
or contact: rich@3dtotal.com

INTRODUCING THE GNOMON WORKSHOP
ONLINE TRAINING SUBSCRIPTION

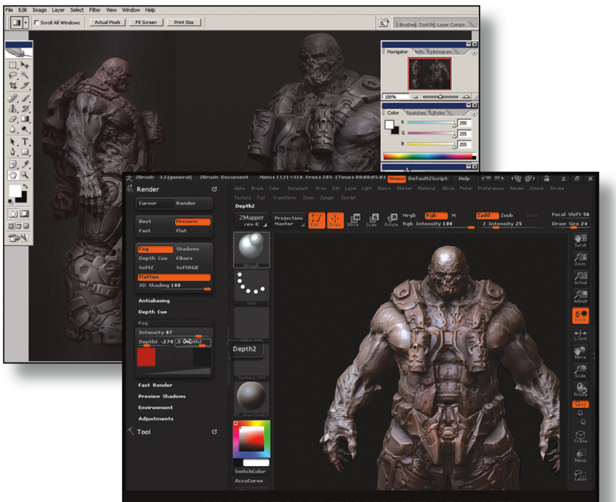
THE SUBSCRIPTION HOMEPAGE

The Gnomon Workshop is proud to announce the release of three new subscription plans to its vast training library. Often requested by individual customers and studios alike, these new subscription plans are being offered at a small fraction of the cost to purchase the same DVDs separately - a great value in professional arts training.

The Gnomon Workshop has created over 300 DVDs and online tutorials - over 1000 hours of training - to educate, inspire and motivate artists around the world. Taught by leading visual effects artists, concept designers, illustrators and sculptors, our tutorials will help you develop the skills you need to become a better artist. For as little as $25/month you can access this unrivaled library, watch new DVDs and online tutorials as they are released, and download tutorial project files.

Purchase a subscription to our entire training library, Plan 1, and broaden your skills as an artist with access to an amazing range of lectures and demos. Choose Plan 2 to learn from the best 3D artists working in the Film and Games industry, or Plan 3 to learn from and be inspired by some of the best artists, Art Directors, Illustrators and Sculptors teaching today.

PLAN 1 All Tutorials		$499/yr
PLAN 2 Visual Effects & Games		$299/yr
PLAN 3 Design & Traditional		$299/yr


HIGH RESOLUTION VIDEO PLAYER

WHAT YOU'LL GET:

24/7 access to the library without the hassle of playing DVDs or storing files locally.

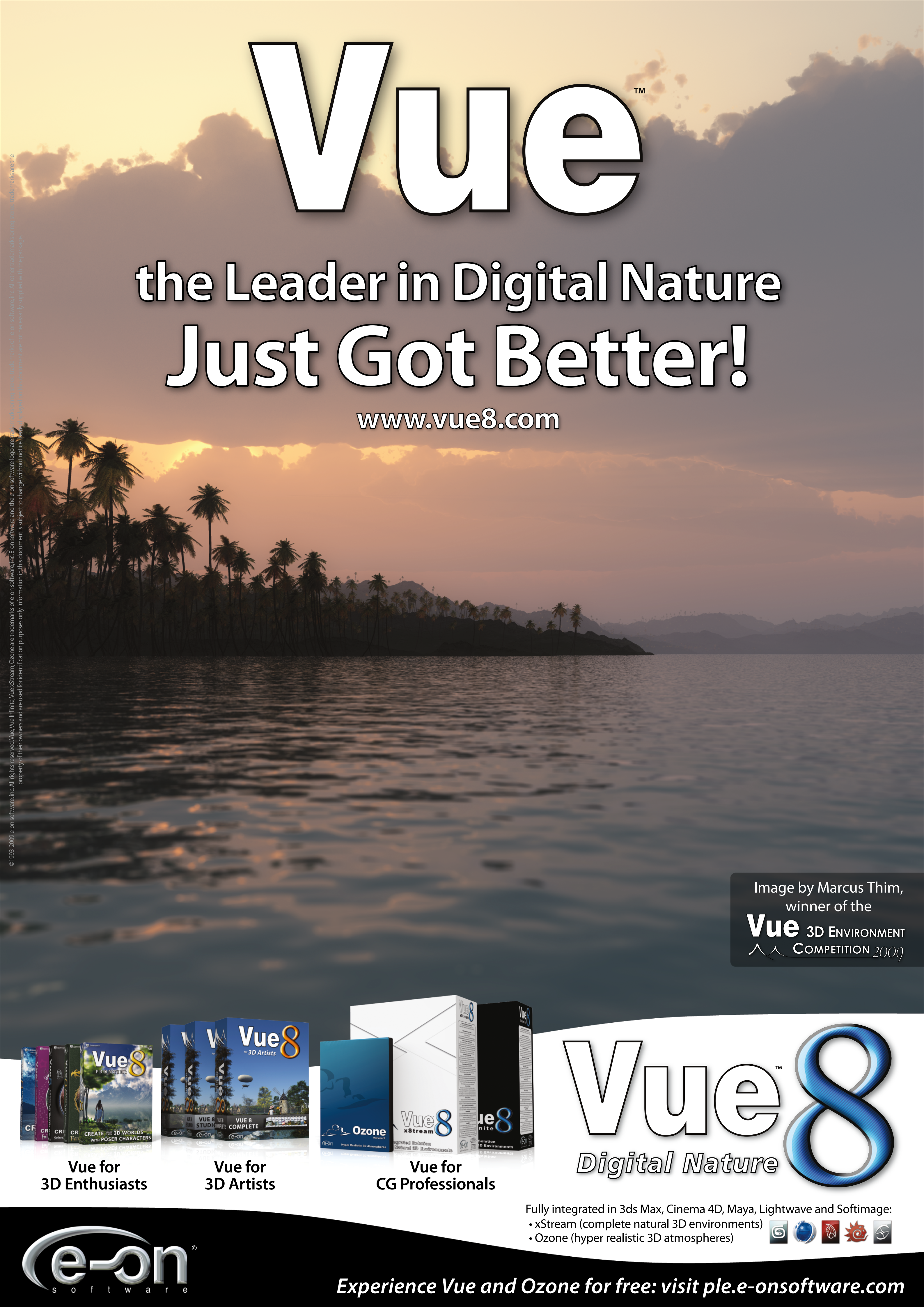
Fast streaming content - all the videos are presented in same size as they appear on the DVDs.

All of the project files that accompany the tutorials on DVD are available to subscribers.

All new tutorials and DVDs are automatically added FREE throughout the duration of your subscription plan.

Learn at your own pace - the video player allows you to pause, rewind and fast forward, as well as go to full screen mode.

TO SIGN UP & FIND OUT MORE INFORMATION VISIT
WWW.THEGNOMONWORKSHOP.COM/SUBSCRIPTION


Vue™
the Leader in Digital Nature
Just Got Better!
www.vue8.com
Image by Marcus Thim, winner of the Vue 3D Environment Competition 2009
Vue for 3D Enthusiasts
Vue for 3D Artists
Vue for CG Professionals
Vue 8™
Digital Nature
Fully integrated in 3ds Max, Cinema 4D, Maya, Lightwave and Softimage:
• xStream (complete natural 3D environments)
• Ozone (hyper realistic 3D atmospheres)
e-on software®
Experience Vue and Ozone for free: visit ple.e-onsoftware.com

Pirate Hype

Making of by Pao (Thitipong Jitmakusol)

Inspired by *Pirates of the Caribbean* at the time of release of *Dead Man's Chest,* Pao – an artist currently working at the award-winning Digital Domain Productions in Venice, California – brings us his own unique interpretation of a sea creature captain. Using various software packages, Pao shows us how you can create stunning character portraits in a limited amount of time, but with maximum impact!

> "I like to go multi-package: I think Mudbox is excellent at painting across seams in real time; BodyPaint can import your PSD files with layers; ZBrush has useful brushes, lets you project 3D textures, and allows you to paint in Photoshop."

MAKING OF PIRATE HYPE

Software Used: Version Information

CONCEPTS

When *Pirates of the Caribbean: Dead Man's Chest* was released, there was no doubt that the CG character, Davy Jones, was simply stunning. I liked all the sea-life characters in the films, and they inspired me to create my own interpretation – just for fun!

My timeframe was roughly about four to five days (down time at work), so I knew it would be too much for me to create a full character during this time. I decided then to simply render the head out in a "headshot" photograph style.

Like with anything I do, I started out with sketching the concept. This helps me tremendously in the modeling process. Obviously, the work flows a lot faster when you know what you want. I looked up references for fish and sea creatures, sketched out a few designs, and came up with this character (**Fig.01**).

Fig.01

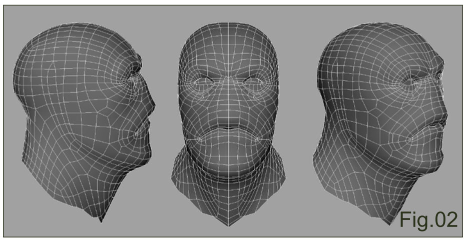


Fig.02

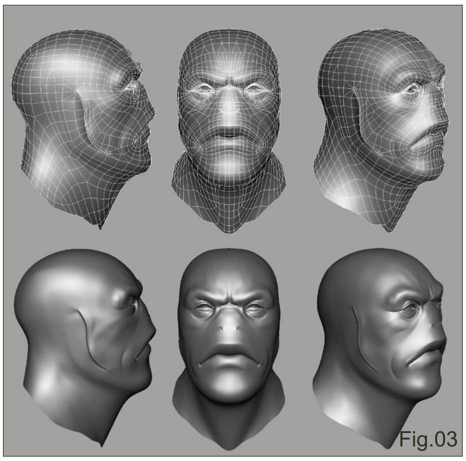


Fig.03

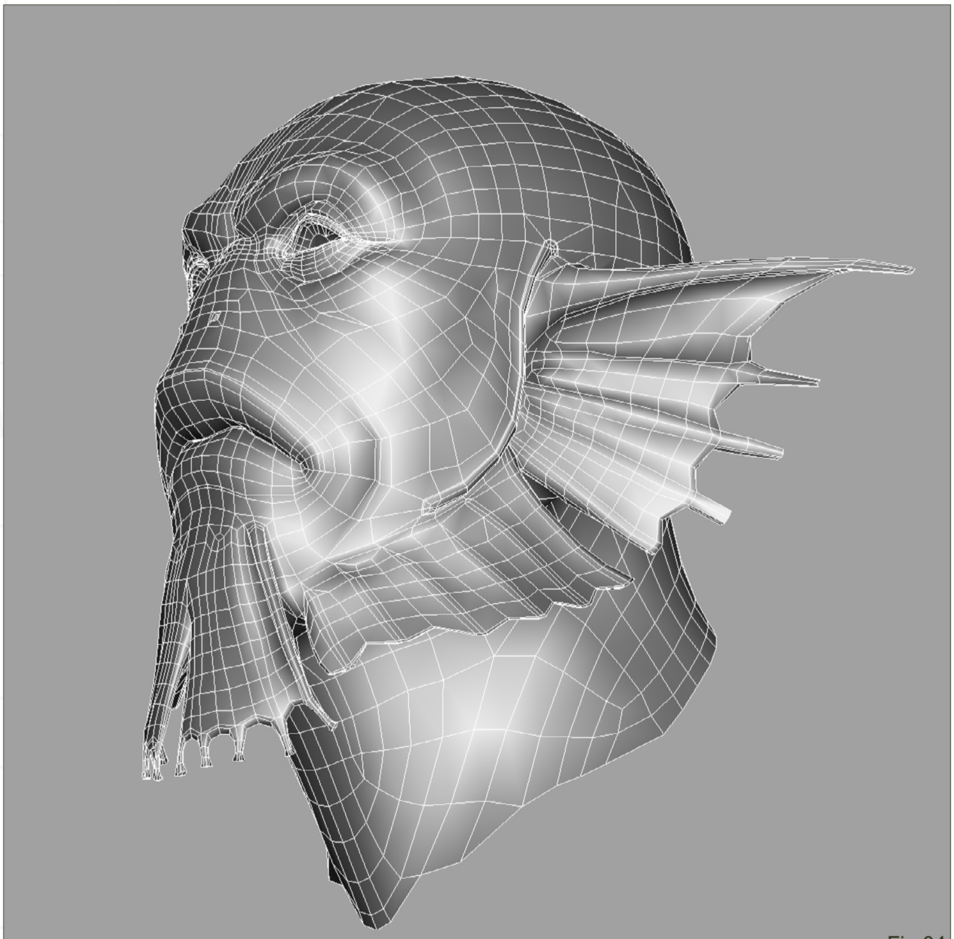


Fig.04

MODELING

I started out with a polygon cube and worked my way up to form a head. I imagined a skull underneath his flesh to keep the form nice and solid. Even though my plan was to render him for a still shot, I still wanted to have good topology – it's just good practice and also handy if I need him for some kind of animation in the future (**Fig.02**).

I built my way up to extra details, like skin folds and creases (**Fig.03**).

Once I was more comfortable with the head, I built in the fins (**Fig.04**).


Fig.05

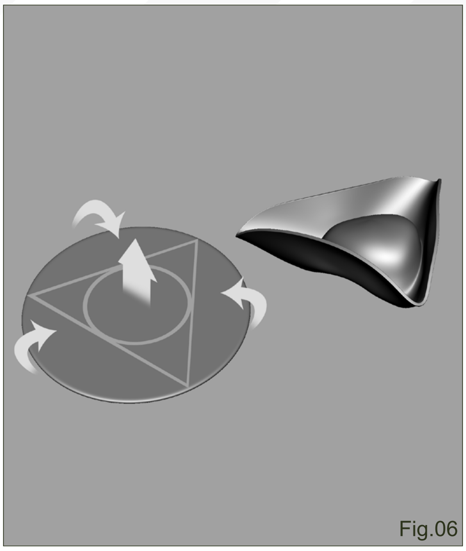


Fig.06

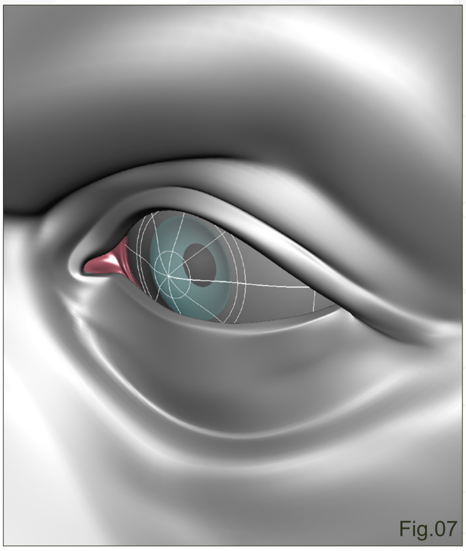


Fig.07

Imperfection is important to make things look more realistic. I added damage to the fins, and to add more character to the model I made his face asymmetrical using the deformer and soft selection. I kept the untouched version as a blend shape, just in case I needed to go back to the symmetrical stage. You would typically do this last, but I was just having fun (**Fig.05**).

For the three-cornered pirate hat, I simply folded a flat, coin shape geometry three ways and pulled the center part up (**Fig.06**).

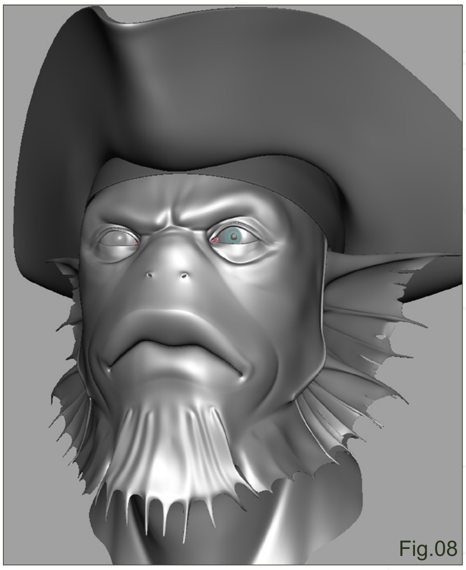


Fig.08


Fig.09

For the eyeball, I had two separate pieces of geometry: one for the iris and choroid (which will be textured); the other for the cornea on top (glossy coat). To keep the eye intact, I added a little membrane piece to the socket as well (**Fig.07**).

At this stage I'd completed the modeling work, so I moved onto un-wrapping the UVs (**Fig.08**).

I then exported my .obj out to ZBrush (Mudbox would have also worked) to sculpt aging skin and extra details. I used the references I gathered earlier to guide me in this process. Some of my references were even good enough for me to create high-res brushes. Eventually, I baked out the displacement map and the ambient occlusion/cavity map (**Fig.09 – 10**).

Fig.10

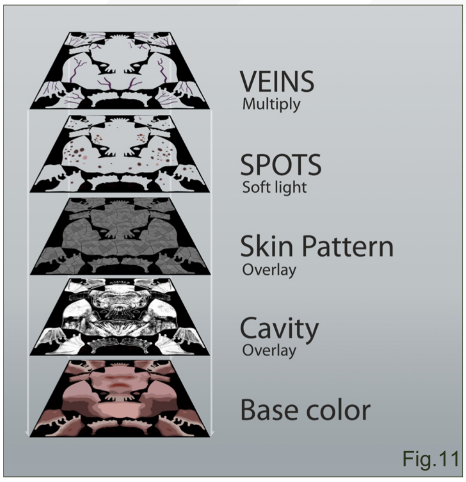


Fig.11

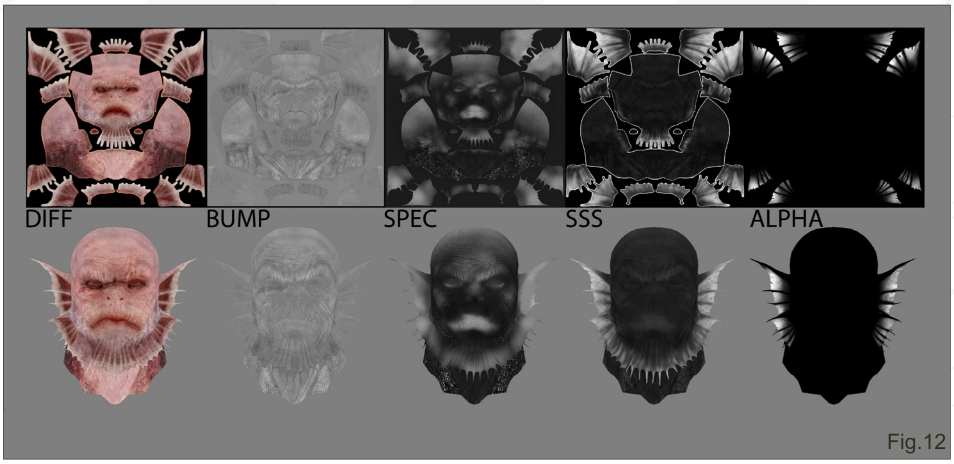


Fig.12

Texture Painting

For reference, to show you how I stack layers in Photoshop, I've created a visual aid for you (**Fig.11**). Keep in mind that this is a simple diagram and projects can get really complex, depending on what type of texturing you are attempting, but for most scenarios I think this is a good starting point. Be flexible on the layers. Guidelines are not rules!

I like to paint in both 3D and 2D. Photoshop is a powerful painting tool, while 3D painting programs (BodyPaint, ZBrush, Mudbox, etc.) have the advantage of painting across the seams and letting you know exactly where you are painting. I like to go multi-package: I think Mudbox is excellent at painting across seams in real time; BodyPaint can import your .psd files with layers; ZBrush has useful brushes, lets you project 3D textures, and allows you to paint in Photoshop. All software has its own strengths and weaknesses, and you should try to learn all of them.


Fig.13

Once I was done painting, I collected my seamless passes from my 3D software and performed my compositing/color tweaking, and added extra details in 2D. I like to have the untouched colors as the base and then build from there. For the pirate, I added details like veins, spots, and a skin pattern on top, and kept them separate so I could adjust them later. It's a great advantage to keep things organized, especially when creating other passes. For example, I can easily use my "Veins" layer to quickly block-out the Sub Surface Alpha mask (so that the lights will not interact with them). I played a lot with different types of layer channels as well. Sometimes Soft Light worked better for me than Overlay, and so on.

I used Layer Comps (Window > Layer Comps) in Photoshop to help me organize my .psd file. It remembers what Opacity or what kind of layer channel you used. For example, my Diffuse map used the "Skin Pattern" layer at 45% Opacity set to Overlay, whereas my Spec map used the "Skin Pattern" layer at 20% Opacity set to "Multiply". Layer Comps can save this information and you can quickly go back to it – very helpful!

I ended up with Diffuse, Spec, Bump, Displacement, and Sub-Surface control passes, and as I wanted the fins on his face to be transparent, I prepared the Alpha pass for that as well (**Fig.12**).

It's always good to check your texture maps in a 3D painting program just so you can quickly see what you can expect to see in the final render (**Fig.13**).

Lighting and Rendering

I went with a basic 3-point lighting setup, trying to make it seem like a flash was coming from the front (a typical head shot for your passport – nothing too fancy). I used the sub-surface scattering shader and plugged all maps in. I also had a sky reflection map plugged in to create that wet, glossy look. The rest was all about tweaking the values.

I posed the character at what I considered to be a cool angle, and hit render (**Fig.14**).

Compositing and Final Touches

If you're upfront about "cheating", then it's not really cheating, is it? I wanted an illustration completed in a limited amount of time, not a turntable or an animation, so I used a few tricks to maximize the impact of the image:

I painted the texture directly on the hat and bandanna, very much like projection painting or matte painting. I cut out some of the fins, placed them in front, placed them behind, and ran a blur on them to create the depth of field. This way the character looks like he has a body, just not a floating head; it's much more believable like this (**Fig.15**).

I ran a Noise filter on the image to make it look like an old photograph, and to finish off, I color corrected the image to get the tone and mood I wanted, and there I had myself the *Pirates Hype* illustration – my fun, little project!

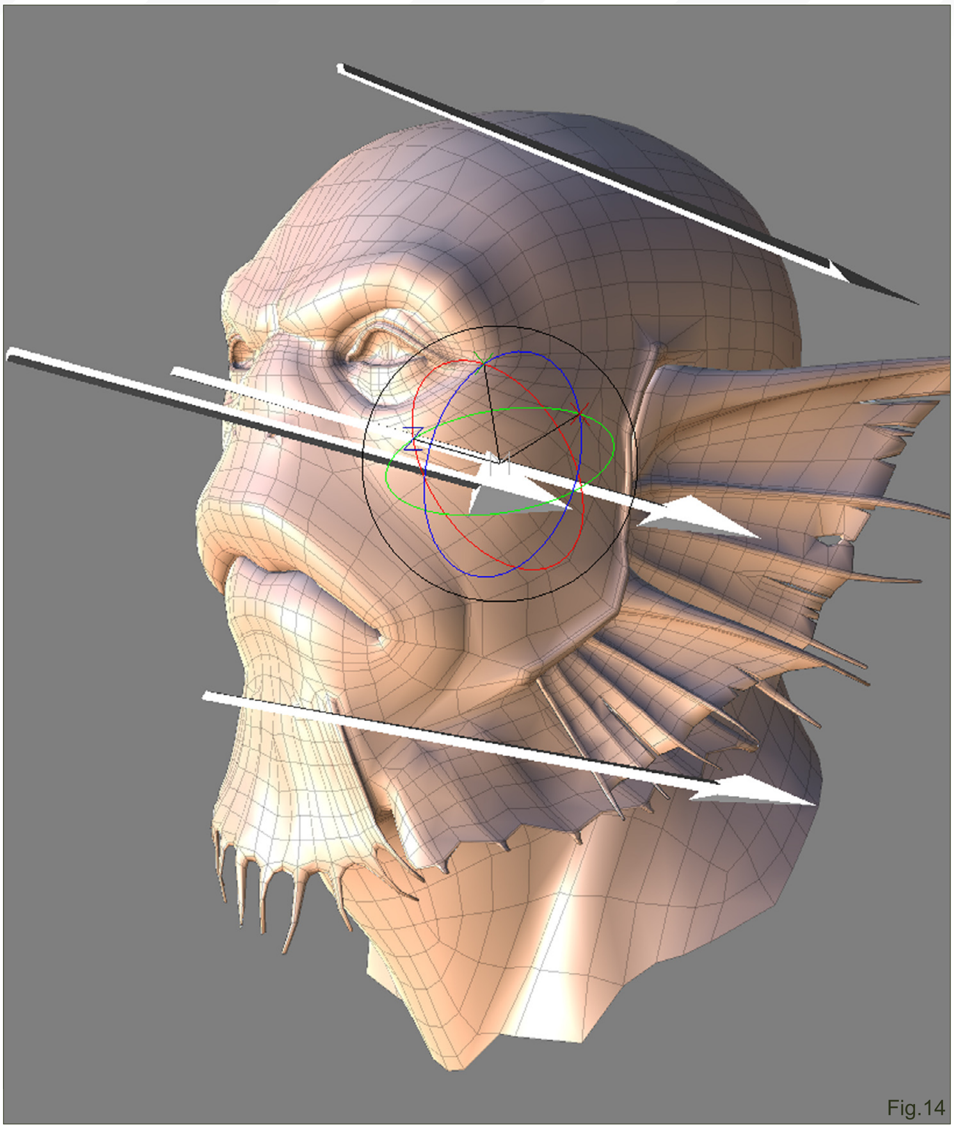


Fig.14

Fig.15

PAO (THITIPONG JITMAKUSOL)

For more from this artist visit

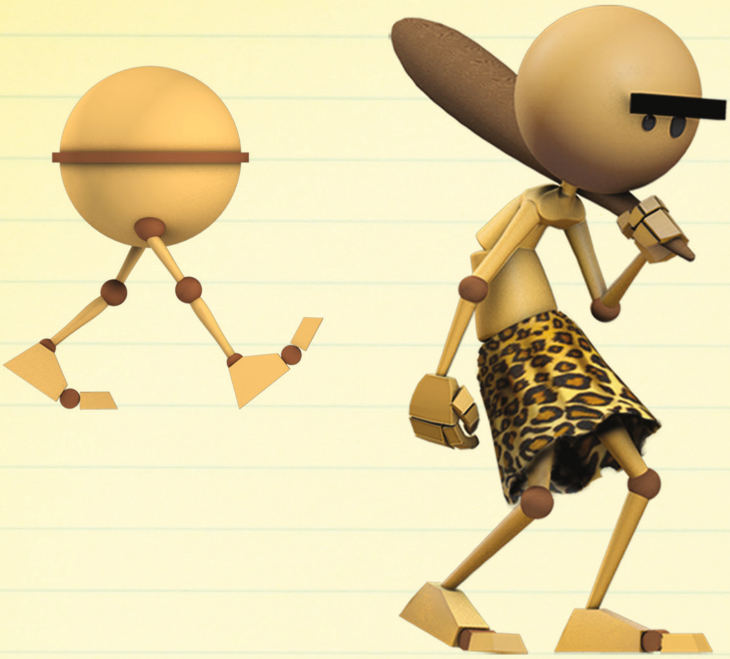
http://www.iampao.com

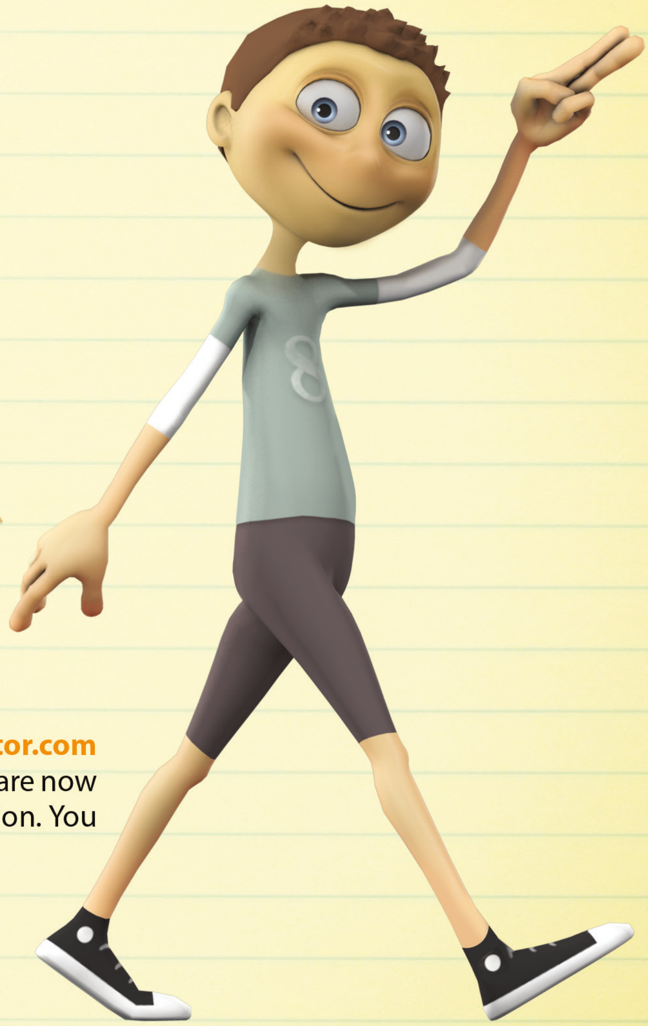
or contact

iampao@gmail.com


Luxology
modo
modo is for artists

ARE YOU SERIOUS ABOUT BECOMING AN ANIMATOR?





Whether you are just starting your journey, or want to get to your dream job faster, **Animation Mentor** is the online character animation school that can help you get there in 18 months.

Check out our program online at **www.animationmentor.com** and read about our student success stories. Many of them are now working in their dream jobs in studio animation production. You can do it. We can help!

What you need to know

- Learn from ***professional working animators***
- Learn ***workflow and production techniques***
- Create a ***demo reel by program completion***
- Join our ***community of students, alumni and mentors***
- Get ***help finding a job from our career placement center***
- Learn from the ***convenience of home***

Learn more at **www.AnimationMentor.com**

ANIMATIONMENTOR.COM
The Online Animation School ®

OUR ALUMNI MADE AN IMPACT IN 2009.

VFS ANIMATION & VISUAL EFFECTS ALUMNI CREDITS IN 2009 INCLUDE 9 Mike Dharney, Animator **2012** Jamie Bowers, Texture Zeke Norton, Previsualization Supervisor | Anuj Patil, Senior Technical Director | Christine Peterson, Digital Compositor **50 Cent: Blood on the Sand (VG)** Giorgio Bertolone, Creature Technical Director **Aliens in the Attic** Rex Ahn, Pre-Visualization Lead | Craig Calvert, CG Supervisor | Julianna Kolakis, Character Designer | Ben Sanders, Supervising Animator | Rommel Shamoun, Compositor | Noel Wright, Digital Compositor | Adam Yaniv, Animation Supervisor **Alvin & the Chipmunks: The Squeakuel** Nicholas Augello, Technical Animator | Christopher Downs, Technical Animator | Amy Lu, Animator | Adam Yaniv, Animation Supervisor **Amelia** Armando Velazquez, Digital Compositor | Clement Yip, Animator **America's Army 3 (VG)** Matthew Turner, Artist **Angels & Demons** Craig Calvert, Pre-Visualization Artist | Jessica Wan, Lead Rotoscope Artist | Noel Wright, Digital Compositor **Armored** Riley Benard, Digital Compositor | Yuta Shimizu, Visual Effects Artist **Astro Boy** Andreas Hikel, Layout Artist Kim Ooi, Animation Director **Avatar** Michael Cozens, Lead Animator | Tamir Diab, Technical Director | Aaron Gilman, Character Animator | Alfredo Luzardo, Layout Technical Director | Ben Sanders, Animator **The Beatles: Rock Band (VG)** Mike Krentz, UI Artist **Brütal Legend (VG)** Marke Pedersen, Senior Artist **Case 39** Riley Benard, Digital Compositor | Craig Calvert, CG Supervisor | Matthias Lowry, Visual Effects | Fion Mok, Matchmove Artist | Teh-wei Yeh, Matchmove Artist **Cirque du Freak: The Vampire's Assistant** Nicholas Augello, Technical Animator | Julianna Kolakis, Character Designer | Ai Saimoto, Lighting Lead **Cloudy with a Chance of Meatballs** Andrew Lawson, Animator | Arun Ram-Mohan, Senior Color and Lighting Technical Director **Coraline** Brian Demoskoff, Animator **A Christmas Carol** Kirk Chantraine, Motion Capture Technical Director | Joel Pennington, Motion Capture Technical Director | Shraga Weiss, Character Modeler | Brent Wong, Character Modeler **District 9** Neill Blomkamp, Director/Co-Writer | Jelmer Boskma, Modeler | Robert Bourgeault, Lighting Lead | Freddy Chavez, Visual Effects Compositor | Dominic Cheung, Lighting Technical Director | Paul Copeland, Visual Effects Artist | Anthony Di Ninno, Animator | Brian Harder, Creature Rigger | Bernhard Huber, Effects Animator | Brett Ineson, Motion Capture Supervisor | Steve Johnston, Render Wrangler | Patrick Kalyn, Animator | Bernhard Kimbacher, Visual Effects Data Coordinator/Compositor | Julianna Kolakis, Creature Texture Painter | Adam Marisett, Visual Effects Artist | Nikolai Michaleski, Compositor | Brendon Morfitt, Digital Artist | Fernando Pazos, Animator | Dan Prentice, Visual Effects Artist | Mike Rhone, Visual Effects Artist | Cesar Rodriguez Bautista, Digital Paint & Roto Artist | Cynthia Rodriguez del Castillo, Digital Paint & Roto Artist | Marc Roth, Visual Effects Artist | Derek Stevenson, Matchmove Lead | James Stewart, Creature Supervisor | Richard Sur, Lighting Technical Director | Anna Tonrungroj, Digital Compositor | Shawn Walsh, Visual Effects Executive Producer | Joey Wilson, Modeler/Texturer | Samson Wong, Matchmove Artist **Drag Me To Hell** Thomas Schelesny, Visual Effects Supervisor **Dragon Age: Origins (VG)** Bobby Bath, Character/Creature Artist | Ryan Lim, Lead Creature Character Artist | Herbert Lowis, Artist | Brian Sum, Concept Artist | Nathan Zufelt, Cinematic Animator **Escape from Planet Earth** Giorgio Bertolone, Creature Technical Director | Anthony Di Ninno, Layout Artist | Craig George, Head of Story | Gary Hendry, Layout Artist | Nicholas Smolyn, Layout Artist **Eureka** Anuj Patil, Lead Compositor | Mike Rhone, Visual Effects Artist **Fast & Furious** Ben Dishart, Texture Artist | Armando Velazquez, Digital Compositor **The Final Destination** David Yabu, Animator **G-Force** John Iskandar, Lighting and Compositing TD | Ken Kaiser, Animator | Hyun Chul Jung, Animator | Andrew Lawson, Animator | Phan Wiantrakoon, Animator **Ghostbusters: The Video Game (VG)** Giorgio Bertolone, Creature Technical Director | Winston Fan, Compositor | Harry Liu, Junior Motion Capture Editor | Jessica Mih, Modeler | Maya Zuckerman, Visual Effects Artist **GI Joe: The Rise of Cobra** Jelmer Boskma, Modeler | Patrick Conaty, Digital Compositor | Ben Dishart, Texture Supervisor | Aruna Inversin, Digital Compositor | Julianna Kolakis, Concept Artist/Modeler | Sean Lewkiw, Visual Effects Artist | Tom Piedmont, Digital Artist | Jeremy Stewart, Senior Animator | Jeff Tetzlaff, Lead Modeler | Jessica Wan, Lead Rotoscope Artist **Grey Gardens** Armando Velazquez, Digital Compositor **Halo 3: ODST (VG)** Bartek Kujbida, Cinematic Animator **Harper's Island** Steve J. McLeod, Digital Compositor **Harry Potter and the Half-Blood Prince** Harry Mukhopadhyay, Lead Effects Technical Director | Pietro Ponti, TD Generalist | Gia Sadhwani, Digital Effects Artist | Kieran Tether, Digital Artist | Teh-wei Yeh, Lighting TD **Ice Age: Dawn of the Dinosaurs** Scott Lemmer, Animator | Thom Roberts, Animator | Brent Wong, Modeler **Invictus** Christopher Ahrens, Lighting Lead | Geoffrey Hancock, Visual Effects Supervisor | Sean Lewkiw, Digital Effects Supervisor | Jason McKeeman, Lead Technical Animator | Farhad Mohasseb, Compositor | Michelle Skrzyniarz, Matchmove Artist | Jose Yapor, Animator **Killzone 2 (VG)** Andrea Arghinenti, Technical Artist **King of the Hill** Michael Loya, Director **Knowing** Tim Rowlandson, Rigging Technical Director | Richard Sur, Lighting Technical Director **Land of the Lost** Nicholas Augello, Massive Technical Director | Tony Etienne, Lighting Supervisor | Amy Lu, Character Animator **Law Abiding Citizen** Freddy Chavez, Compositor | Veronica Marino, Compositor | James McPhail, Effects Animator | Jacob Curtis Miller, Matchmover | Jay Randall, Visual Effects Supervisor Derek Stevenson, Matchmover | Shawn Walsh, Visual Effects Executive Producer **The League of Super Evil** Daphne De Jesus, Compositor | Barry Karnowski, Animation Supervisor **The Lord of the Rings: Conquest (VG)** Michelle Lam, Lead Character Artist **The Lovely Bones** Michael Cozens, Previs Animator **Monsters vs. Aliens** Jiyoung Lee, Texture Artist **Night at the Museum: Battle of the Smithsonian** Rex Ahn, Previsualization Lead | Nicholas Augello, Technical Animator | Christopher Downs, Technical Animator | Joshua Herrig, Lead Lighter | Zeke Norton, Previsualization Supervisor | Ai Saimoto, Lighting Lead | Ben Sanders, Supervising Animator | Derek Stevenson, Previsualization Artist | Joey Wilson, Previsualization Artist | Adam Yaniv, Animation Supervisor **Orphan** Francisco Moncayo Moreno, Digital Artist | Shawn Walsh, Visual Effects Executive Producer **Paul Blart: Mall Cop** Riley Benard, Digital Compositor **Planet 51** Sandro di Segni, Senior Effects TD | Jorge Kirschner Torres, Modeler | Gianfranco Valle, Effects Animator **Prototype (VG)** Harry Ahn, Lead Cinematics Animator | Bobby Bath, Lead Character Artist **Punch-Out!! (VG)** Nelson Garcia, Concept Artist **Pushing Daisies** Scott Dewis, Visual Effects **Red Faction: Guerrilla (VG)** Dilber Mann, Project Manager **Resident Evil 5 (VG)** Jacob Palmer, Animator **Rock Band Unplugged (VG)** Mike Krentz, Artist **Sanctuary** Julie Bergman, Animator | Mladen Miholjcic, Visual Effects Artist **Shorts** David Yabu, Animator **Sorority Row** Mike Rhone, Visual Effects Artist **Star Trek** Aruna Inversin, Digital Compositor | Tom Piedmont, Digital Plate Restoration | Kieran Tether, Digital Artist | Teh-wei Yeh, Digital Artist **Stargate Universe** Daphne De Jesus, Digital Compositor | Julianna Kolakis, Character Designer | Daniel Osaki, Lead 3D Modeler | Anna Tonrungroj, Digital Compositor **Supernatural**, Daphne De Jesus, Digital Compositor **Surrogates** Anthony Di Ninno, Animator | Joshua Herrig, Lighting Artist/Look Dev Artist | Matthias Lowry, Digital Compositor | Laurie Powers, Compositor | Teh-wei Yeh, Digital Artist **Tales of Monkey Island (VG)** Jason Findley, Character Artist **Terminator Salvation** Geeta Basantani, Digital Matte Painter | Teh-wei Yeh, Lighting Technical Director **Transformers: Revenge of the Fallen** Allen Holbrook, Animator | Aruna Inversin, Compositor | Stephen King, Animator | Henri Tan, Creature Technical Director | Kieran Tether, Digital Artist | Teh-wei Yeh, Digital Artist **The Twilight Saga: New Moon** Dominic Cheung, Lighting Technical Director **Uncharted 2: Among Thieves (VG)** Mike Yosh, Lead Animator **Underworld: Rise of the Lycans** Pearl Hsu, 3D Artist | Lon Molnar, Visual Effects Production Executive **Up** Bill Watral, Visual Effects Artist **Warhammer 40,000: Dawn of War II (VG)** Ian Cumming, Senior Artist | Allan Dilks, Artist | Nathan Hocken, Lead Animator | Christine Hubbard, Artist | Claire Roberts, Artist | Jefferson Takahashi, Artist **Watchmen** Ori Ben-Shabat, Compositor | Jelmer Boskma, Previs Modeler | Freddy Chavez, Compositor | Dominic Cheung, 3D Artist | Ben Dishart, Texture Artist | Ty Duperron, Modeler | Pearl Hsu, 3D Artist | Bernhard Kimbacher, Digital Artist | Sean Lewkiw, Technical Head of 3D | Matthias Lowry, Digital Compositor | James McPhail, Digital Effects Artist | Jacob Curtis Miller, Digital Artist | Lon Molnar, Visual Effects Supervisor | Harry Mukhopadhyay, Lead Effects TD | Cynthia Rodriguez del Castillo, Digital Artist | Derek Stevenson, Matchmove Artist | Shawn Walsh, Visual Effects Supervisor | Samson Wong, Compositor **Wheelman (VG)** Laura Gorrie, Senior Animator **Whiteout** Armando Velazquez, Digital Compositor | Clement Yip, Animator **Wolfenstein (VG)** Jason Martin, Modeler **X-Men Origins: Wolverine** Geeta Basantani, Digital Matte Painter | Rommel Shamoun, Compositor | Jeremy Stewart, Previs Artist Zombieland Mike Rhone, Visual Effects Artist

Your name here.

VFS

3D ANIMATION & VISUAL EFFECTS | CLASSICAL ANIMATION | DIGITAL CHARACTER ANIMATION

Vancouver Film School. **vfs.com/animationvfx**

VFS student work by Thiago Martins

Digital Art Masters
Volume 4

With the release of 3DTotal's latest book, *Digital Art Masters: Volume 4*, we have some exclusive chapters for you...

This book is more than just an artwork book. Not only does it feature full-colour, full-page images, but each artist has given a detailed description, in their own words, of the creation process behind each piece of published artwork. And they've done it especially for this book!

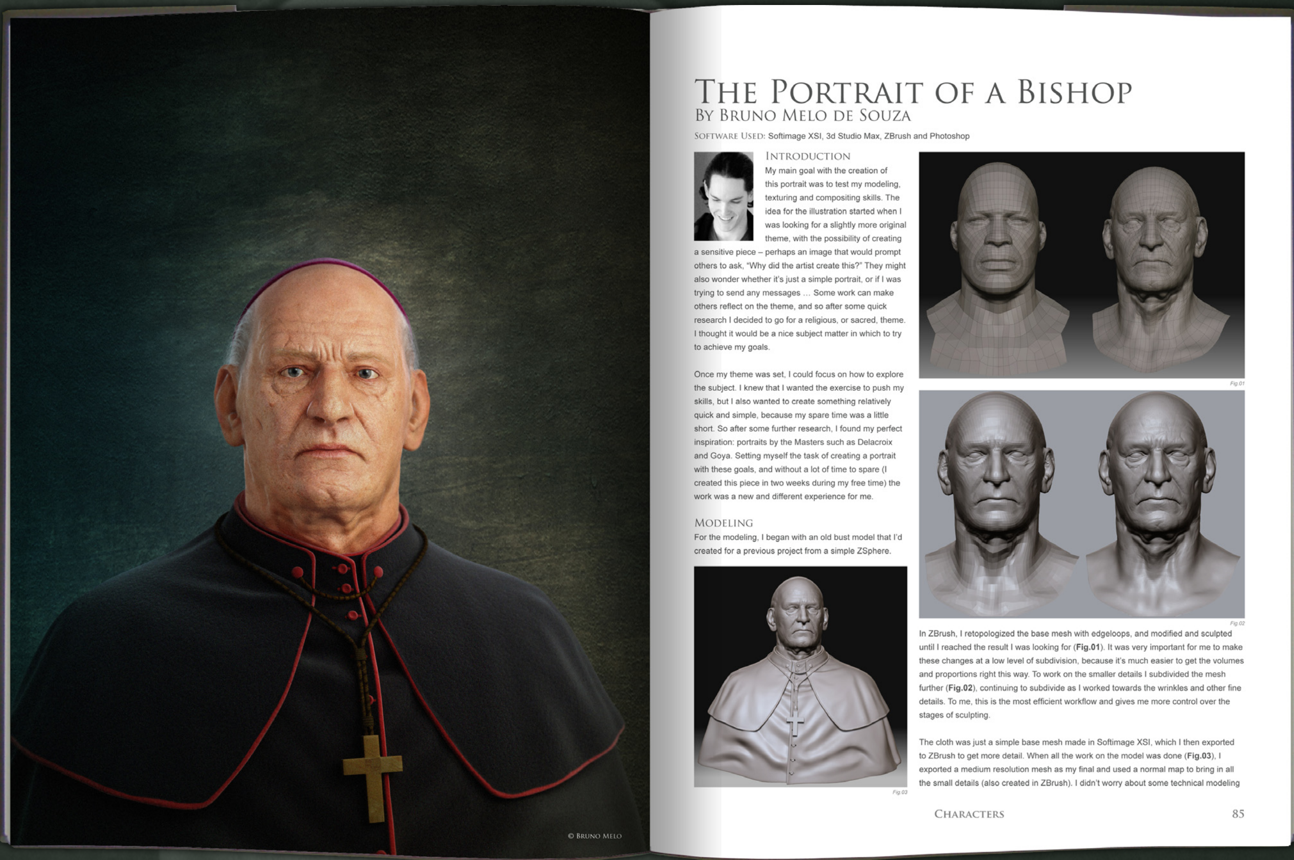
This month we feature:

"The Portrait of a Bishop"

by Bruno Melo de Souza

© 2009 3DTotal.com. Published by Elsevier Ltd. All rights reserved.

The following shots of the “The Portrait of a Bishop” book pages are featured here in full-resolution and can be read by zooming in...



The Portrait of a Bishop

By Bruno Melo de Souza

Software Used: Softimage XSI, 3d Studio Max, ZBrush and Photoshop

Introduction

My main goal with the creation of this portrait was to test my modeling, texturing and compositing skills. The idea for the illustration started when I was looking for a slightly more original theme, with the possibility of creating a sensitive piece – perhaps an image that would prompt others to ask, “Why did the artist create this?” They might also wonder whether it's just a simple portrait, or if I was trying to send any messages … Some work can make others reflect on the theme, and so after some quick research I decided to go for a religious, or sacred, theme. I thought it would be a nice subject matter in which to try to achieve my goals.

Once my theme was set, I could focus on how to explore the subject. I knew that I wanted the exercise to push my skills, but I also wanted to create something relatively quick and simple, because my spare time was a little short. So after some further research, I found my perfect inspiration: portraits by the Masters such as Delacroix and Goya. Setting myself the task of creating a portrait with these goals, and without a lot of time to spare (I created this piece in two weeks during my free time) the work was a new and different experience for me.

Modeling

For the modeling, I began with an old bust model that I'd created for a previous project from a simple ZSphere.

Fig.01

Fig.02

Fig.03

In ZBrush, I retopologized the base mesh with edgeloops, and modified and sculpted until I reached the result I was looking for (**Fig.01**). It was very important for me to make these changes at a low level of subdivision, because it's much easier to get the volumes and proportions right this way. To work on the smaller details I subdivided the mesh further (**Fig.02**), continuing to subdivide as I worked towards the wrinkles and other fine details. To me, this is the most efficient workflow and gives me more control over the stages of sculpting.

The cloth was just a simple base mesh made in Softimage XSI, which I then exported to ZBrush to get more detail. When all the work on the model was done (**Fig.03**), I exported a medium resolution mesh as my final and used a normal map to bring in all the small details (also created in ZBrush). I didn't worry about some technical modeling

Characters 85

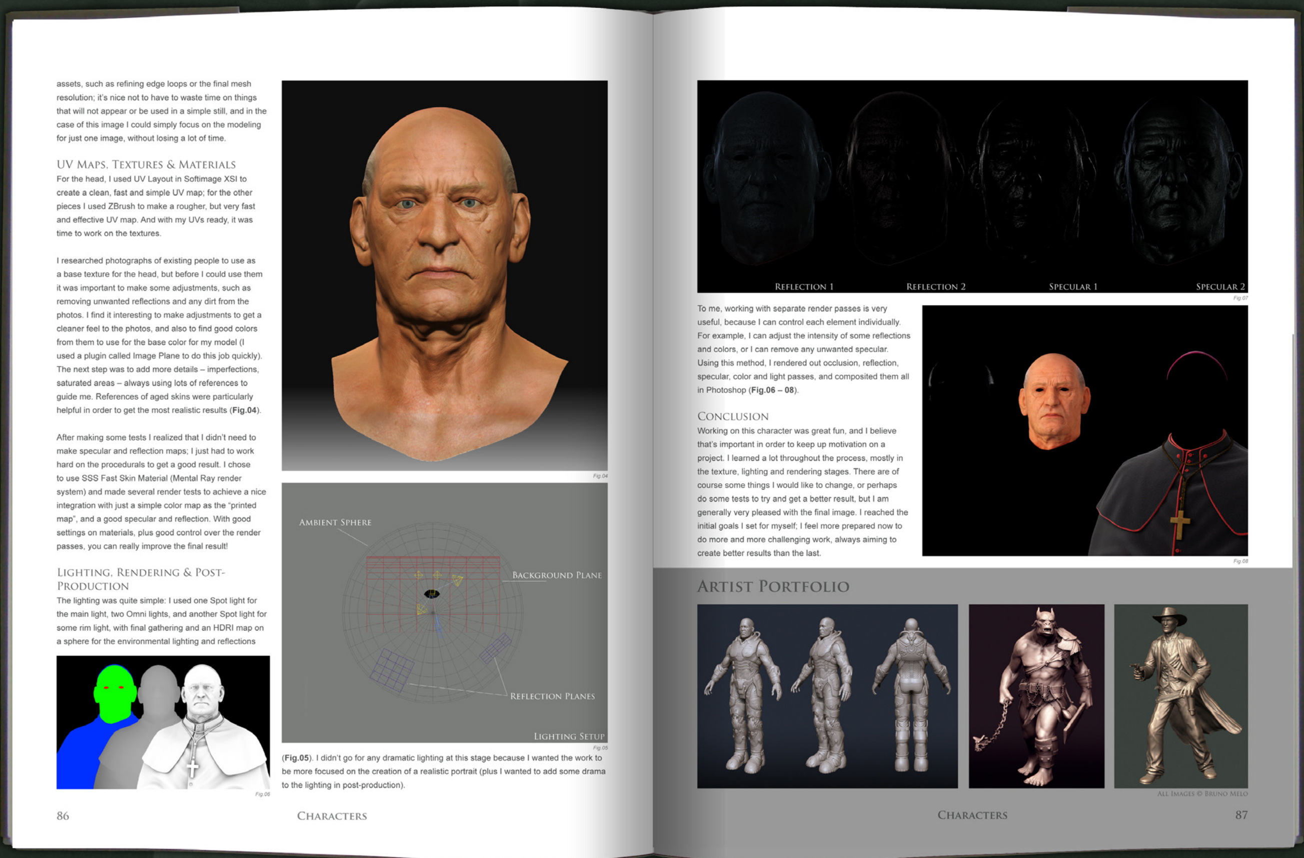
Digital Art Masters

Volume 1, 2, 3 & 4

Now avaliable from the 3DTotal shop:

http://www.3dtotal.com/books/

(Note: if a security dialogue box appears, tick ‘Remember’, then click ‘Allow’)



assets, such as refining edge loops or the final mesh resolution; it's nice not to have to waste time on things that will not appear or be used in a simple still, and in the case of this image I could simply focus on the modeling for just one image, without losing a lot of time.

UV Maps, Textures & Materials

For the head, I used UV Layout in Softimage XSI to create a clean, fast and simple UV map; for the other pieces I used ZBrush to make a rougher, but very fast and effective UV map. And with my UVs ready, it was time to work on the textures.

I researched photographs of existing people to use as a base texture for the head, but before I could use them it was important to make some adjustments, such as removing unwanted reflections and any dirt from the photos. I find it interesting to make adjustments to get a cleaner feel to the photos, and also to find good colors from them to use for the base color for my model (I used a plugin called Image Plane to do this job quickly). The next step was to add more details – imperfections, saturated areas – always using lots of references to guide me. References of aged skins were particularly helpful in order to get the most realistic results (**Fig.04**).

After making some tests I realized that I didn't need to make specular and reflection maps; I just had to work hard on the procedurals to get a good result. I chose to use SSS Fast Skin Material (Mental Ray render system) and made several render tests to achieve a nice integration with just a simple color map as the “printed map”, and a good specular and reflection. With good settings on materials, plus good control over the render passes, you can really improve the final result!

Lighting, Rendering & Post-Production

The lighting was quite simple: I used one Spot light for the main light, two Omni lights, and another Spot light for some rim light, with final gathering and an HDRI map on a sphere for the environmental lighting and reflections

Fig.06

Fig.04

Ambient Sphere

Background Plane

Reflection Planes

Lighting Setup

Fig.05

(**Fig.05**). I didn't go for any dramatic lighting at this stage because I wanted the work to be more focused on the creation of a realistic portrait (plus I wanted to add some drama to the lighting in post-production).

86 Characters

Reflection 1 Reflection 2 Specular 1 Specular 2

Fig.07

To me, working with separate render passes is very useful, because I can control each element individually. For example, I can adjust the intensity of some reflections and colors, or I can remove any unwanted specular. Using this method, I rendered out occlusion, reflection, specular, color and light passes, and composited them all in Photoshop (**Fig.06 – 08**).

Conclusion

Working on this character was great fun, and I believe that's important in order to keep up motivation on a project. I learned a lot throughout the process, mostly in the texture, lighting and rendering stages. There are of course some things I would like to change, or perhaps do some tests to try and get a better result, but I am generally very pleased with the final image. I reached the initial goals I set for myself; I feel more prepared now to do more and more challenging work, always aiming to create better results than the last.

Fig.08

Artist Portfolio

All images © Bruno Melo

Characters 87

© 2009 3DTotal.com. Published by Elsevier Ltd. All rights reserved.

Subscribe

SUBSCRIBE NOW & SAVE UP TO 25%

on this already amazing value publication!

12 ISSUES FOR THE PRICE OF 9

£24.75 save £8.25 (approx - $35.91 save $11.97)

6 ISSUES FOR THE PRICE OF 5

£13.75 save £2.75 (approx - $19.95 save $3.99)

Have your 3DCreative Magazine Download link delivered automatically to your inbox every month...and have it before anyone else!

3DC next month

Here is what's in next months issue of 3dcreative

Interviews

Pao (Thitipong Jitmakusol)

Tutorials

V-Ray for 3ds Max:
Chapter 2 - Vray Materials + Textures
by Eric Ennis

NEW!!! Environment Lighting:
Volume 2 - Outdoor Scene
Chapter 1 - for 3ds Max + Vray
3ds Max + MR, Maya, Cinema4D

NEW!!! Cedric Seaut Character Modeling
Chapter 1 - Concept by Cedric Seaut

Creating a Fantasy Scene Using 3D, Photography and Post Production
Chapter 3 by Richard Tilbury

Galleries

another **10 of the best**
Images from around the world!

visit www.3dcreativemag.com for full information and to purchase current and previous issues for only £2.75 each!

Image by Cedric Seaut

3dtotal.com

Is a resource website for the CG community; amongst our growing number of products for CG artists, we produce two monthly downloadable PDF magazines – *2DArtist* and *3DCreative*. We are based in the West Midlands, in the UK, and our intention with our magazines is to make each issue as full of great articles, images, interviews and tutorials as possible. If you would like more information on 3DTotal or our magazines, or if you have a question for one our team, please use the links below.

Contact Information

http://www.3dtotal.com
http://www.3dcreativemag.com
http://www.2dartistmag.com

Editor & Content Manager > Lynette Clee
lynette@3dtotal.com
Lead Designer > Chris Perrins
chrisp@3dtotal.com
Marketing > Jo Hargreaves
jo@3dtotal.com

Partners

If you have a CG community website and would like to support *3DCreative* and/or *2DArtist* magazine by showing our banners, please contact Lynette Clee at the email address above

Available Now!

Digital Art Masters
: Volume 4

288 Page Preview Online!

Features 50 of the finest digital 2D and 3D artists working in the indusrty today, from the likes of:

Loïc e338 Zimmermann | James Paick
Craig Sellars | Jelmer Boskma
Maciej Kuciara | Daarken| Marek Denko
Kekai Kotaki | Andrew Hickinbottom
Marek Okoń

Buy the book to see just how they create their incredible imagery!

Hardback - 21.6cm x 27.9cm in size
288 Full Colour Premium Paper Pages
ISBN: 978-0-240-52171-8

"Digital Art Masters is getting better and better at showcasing some of today's best digital artists. The way the book shows the processes of achieving great pictures provides a good opportunity to learn from these artists, and keeps you challenged in your own art."

Raphael Lacoste | www.raphael-lacoste.com/

3dtotal.com

for more products in our range visit http://www.3dtotal.com/shop

3ds max

NEXT GEN

CHARACTER CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

Chapter 1 – Low Poly Modelling | Jul 09

Chapter 2 – High-Poly Modelling Part 1 | Aug09

Chapter 3 – High-Poly Modelling Part 2 | Sep09

Chapter 4 – Mapping / Unwrapping | Oct 09

Chapter 5 – Normal Mapping – Texturing | Nov 09

Chapter 6 – Materials, Lighting & Rendering

The final installment in this series will discuss setting up a light rig, creating a shader for our character and show how to apply the numerous textures made in the previous chapter. The notion of body hair through the use of alpha maps will complete the character, before concluding with some additional accessories in the form of shackles, a chain and a wooden club.

DOWNLOAD RESOURCES

- Free Low Poly Model & Textures

Chapter 6 - Materials, Lighting & Rendering

Software Used: 3ds Max, Shader FX, ZBrush, Photoshop

Welcome to part six of this realtime character creation tutorial. We've learnt a lot throughout this series through low- and high-poly modeling, unwrapping, normal map generation, texturing, and a whole lot in-between. But our journey is not over yet. In this part we will go through setting up a light rig, creating a shader for our character from scratch, and applying the textures. We will look at some techniques to create hair and eyes, and finalize our character, bringing together all the pieces of the previous parts – along with a few new accessories and even a weapon to boot!

We will start off by creating a simple 3-point light rig, which will light our character in an interesting way that will bring out the 3D form of the object. 3-point light rigs have been widely used in the photographic industry for many years; they can fairly accurately depict our subject whilst the subject remains visually appealing and flattering.

1. Open Max and load in your low poly character (**Fig.01**).

2. Create a new cylinder with a large base (**Fig.02**).

3. Convert the cylinder into an Editable Poly object, and then select the top face and delete it (**Fig.03**).

Fig 01

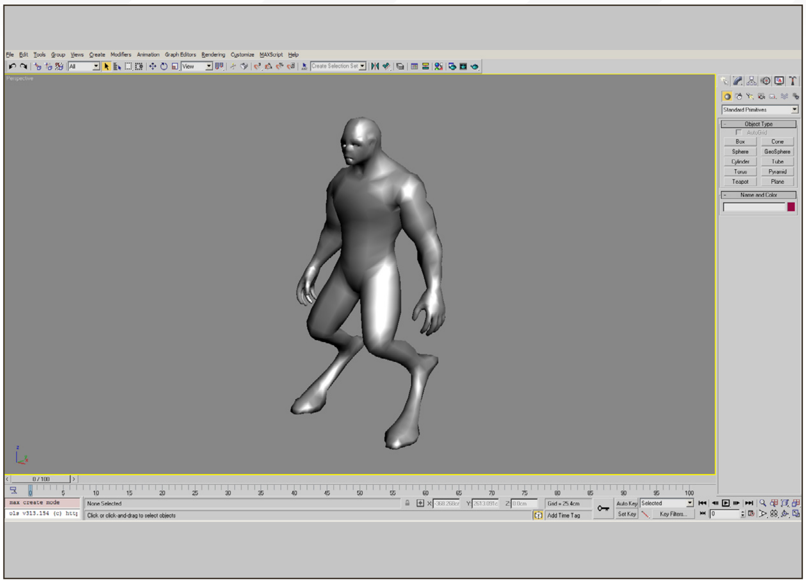


Fig 02

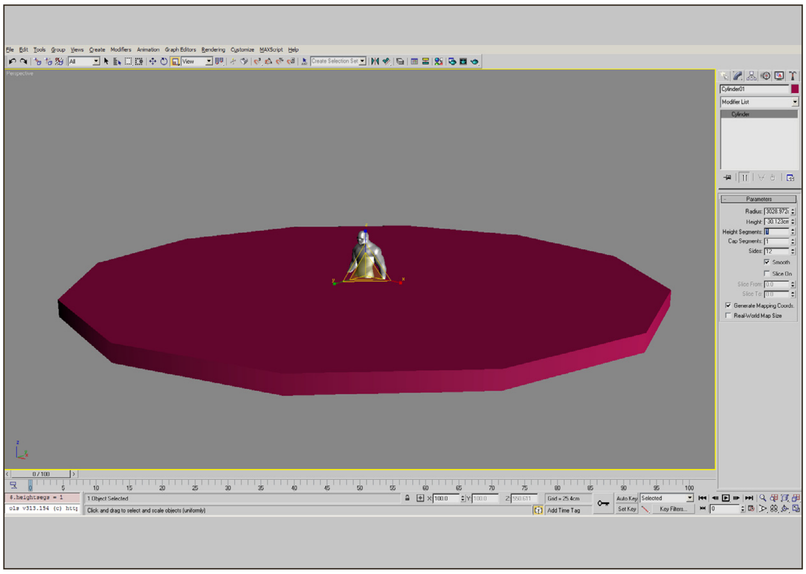
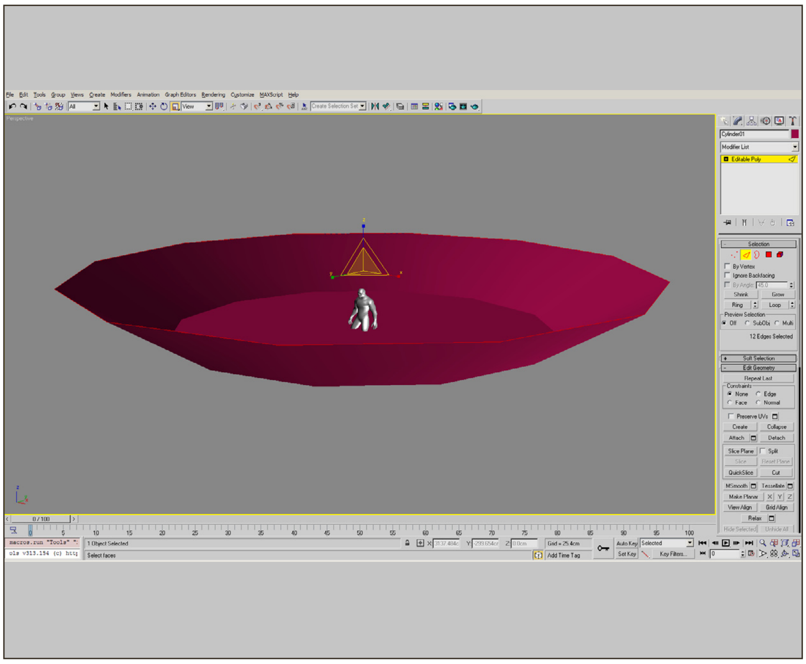
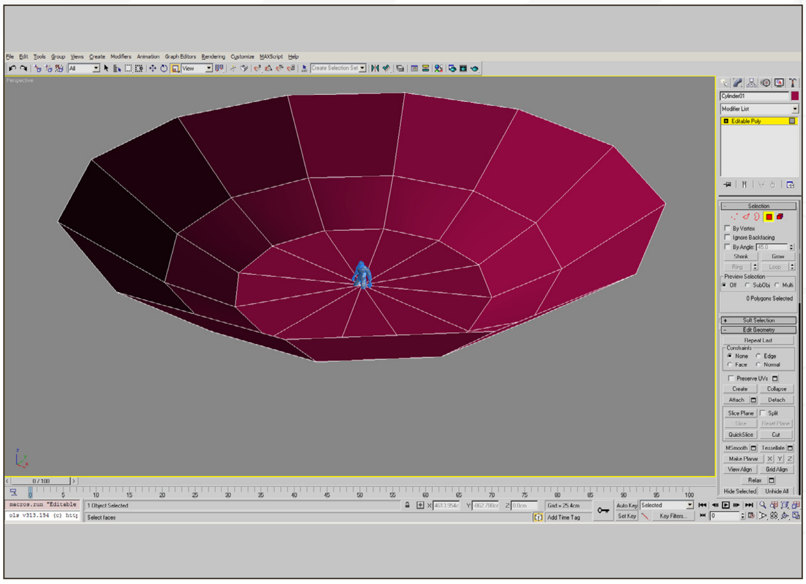


Fig 03



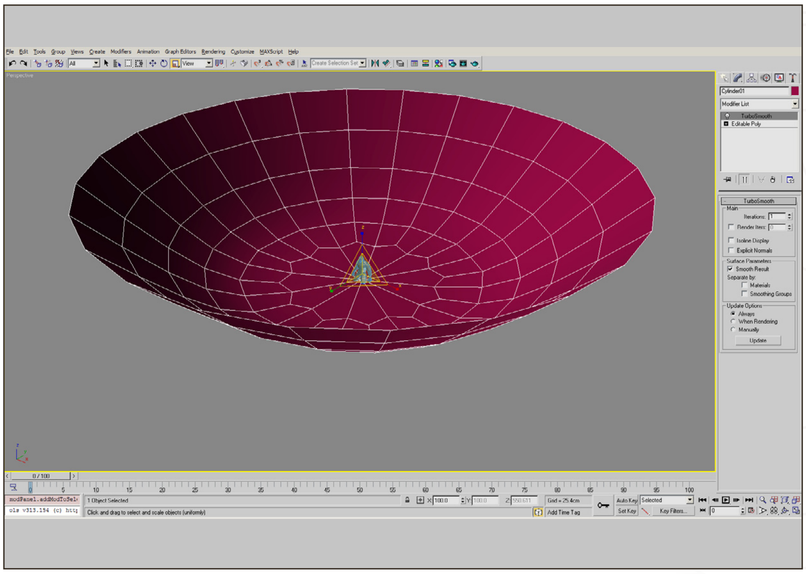
4. Select all the border edges around the top and uniformly scale those outwards. Hold down Shift and scale them out once again, dragging them upwards as well this time. Holding Shift whilst dragging an edge extrudes the edge (**Fig.04**).

Fig 04



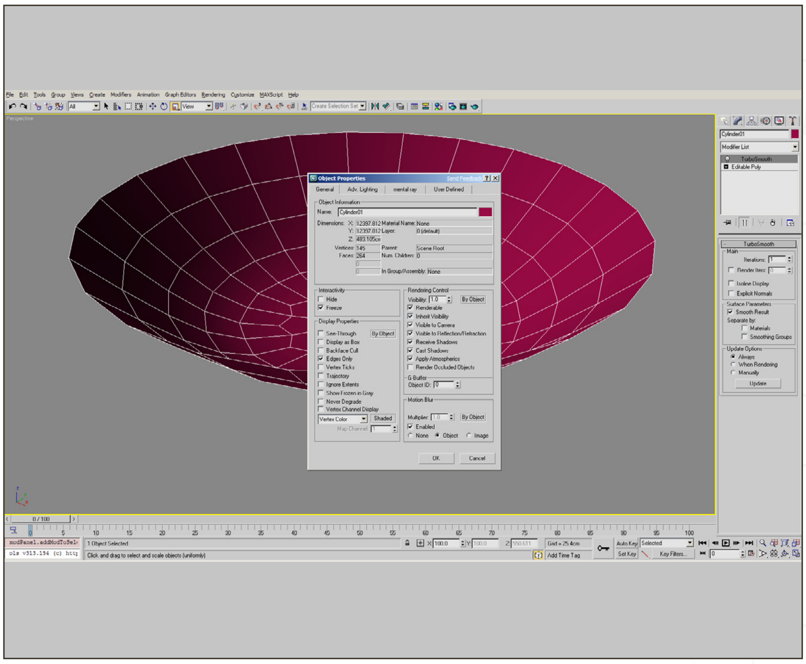
5. Go to face selection mode and select all the faces. Under Edit Geometry in the modifier panel, click Flip. This ensures that the face normals are pointing upwards, and therefore our surface will be lit correctly. De-select the faces, and then apply a Turbosmooth modifier on top of our object (**Fig.05**).

Fig 05



6. Apply a standard material to the object; right-click on the object and select Object Properties. Tick the box labeled “Freeze”. This ensures that the model cannot be selected. Also, un-tick the box labeled “Show frozen in gray”, as this way our object will display with its texture and material, rather than simply a gray mesh (**Fig.06**).

Fig 06



7. In the Create tab of the control panel, click on the third icon – the Lights menu. Inside this menu we can select Target Spot. There are a bunch of different lights here that we could use, but Target Spot will work best for our needs as we can directly position our lights and light targets, specify falloff values, and specify hotspots. Select Target Spot and drag the spotlight out into the location shown.

If you’re using Max 2008 or higher, we have access to viewport shadows, which are realtime shadows similar to those used in videogames and can be used to add more depth to our scene. In the long run they will help refine the look of our character. Sometimes viewing just our textures or just our model in an unlit space can lead to us not noticing certain things about the model that it might be too late to change

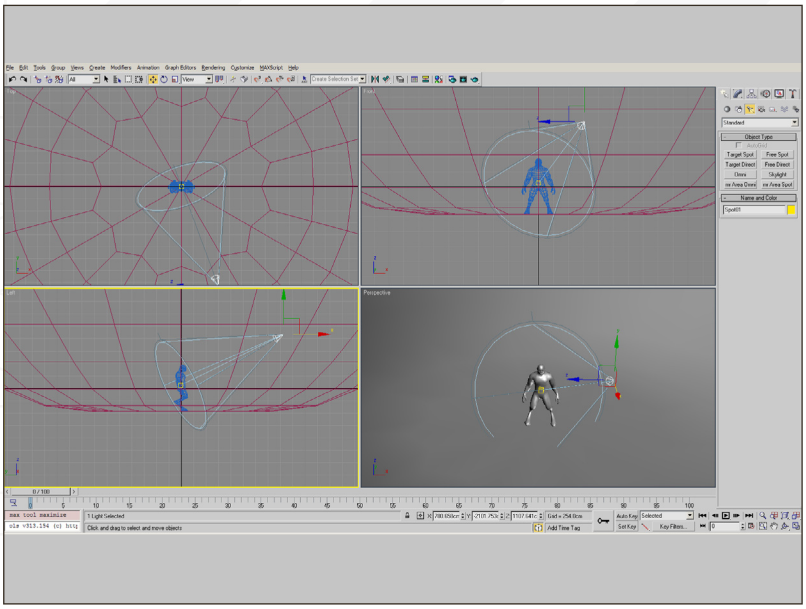


Fig 07

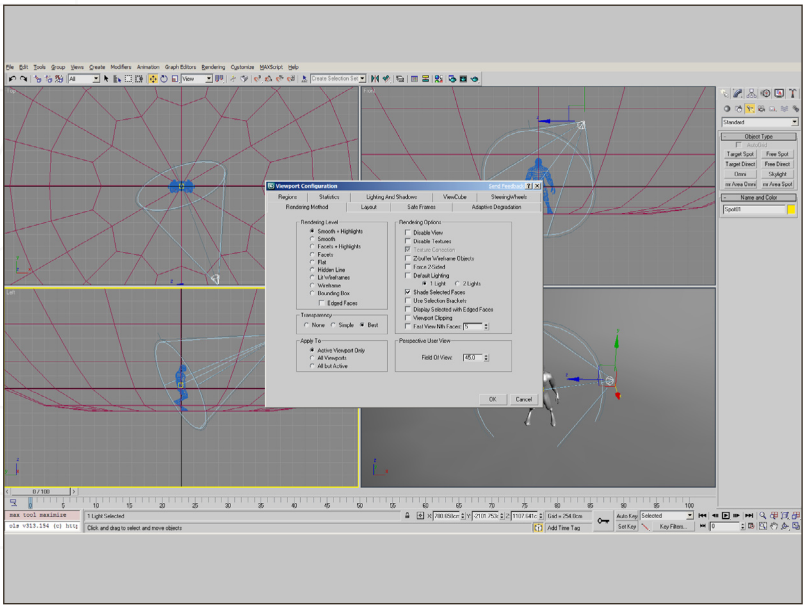


Fig 08

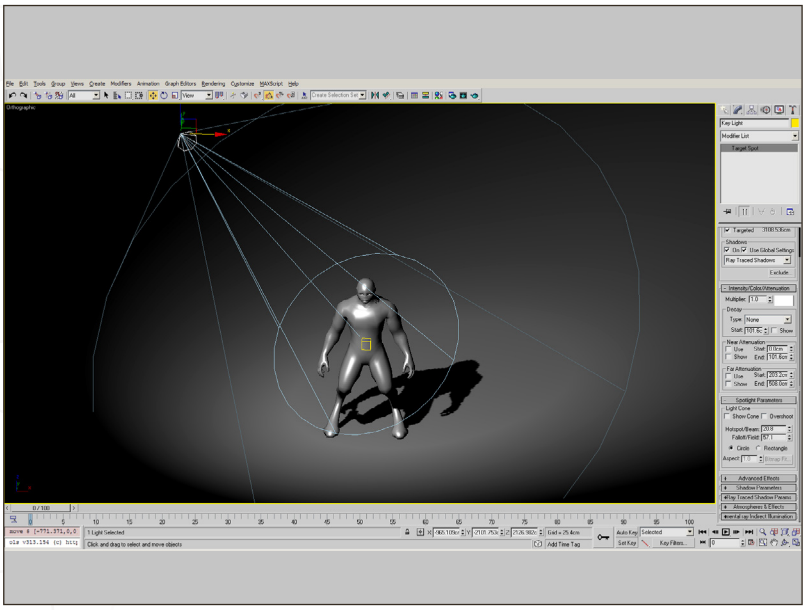


Fig 09

later on. With that said right-click over the viewport and select “Viewport Lighting and Shadows”. There are three options: None, Good, and Best. We will be using Best. When using multiple photometric lights, or area lights, Best will display their color and light shape, whereas Good will simply display their color and an approximation of the shape. The shadow quality with Good will also be lower. The performance is of course improved when using Good mode, but with a drop in accuracy. For such a simple scene here with only spotlights, we can use Best without any noticeable slow down, but people on older computers may want to use the Good setting. If no shadows display after changing this setting, select each light in turn, right-click, and make sure Viewport Shadows is checked (**Fig.07**).

8. Now, it’s important to reflect these changes we’re making in the Viewport. Make sure the scene is not being lit by the default lighting, which is cast directly from the camera, but using the “real” lights that we’re placing in the scene now. Right-click over our Viewport and, under the Rendering Method tab, look for Default Lighting. Make sure Default Lighting is unchecked, and then click OK (**Fig.08**).

9. Move the spotlight over to the left-hand side of the model. This will be our Key light, so name it as such. In its modifier panel we have our light options. We can change the Intensity by dialing up the Multiplier, we can change the Color by clicking the color swatch next to it, and we can change multiple other aspects in this menu as well.

What we want to do now is change the Falloff between the Hotspot and the light termination. Expand the Spotlight Parameters submenu and change the Hotspot/Beam value to something much smaller, somewhere in the range of 20. Increase the Falloff/Field to something much higher, around 60. The Key light is the strongest light and will be our main shadow casting light (**Fig.09**).

10. Clone the light by Shift-and-dragging it over to the right-hand side. In the menu box that pops up – make sure the light is a copy and not an instance – name it Fill Light, and then click OK (**Fig.10**).

11. We can decrease the Multiplier on the Fill light to something around 0.4 and also move the light down a little bit. The Fill light stops the unlit side of the object appearing too dark by throwing a little bit of light back into the scene and illuminating the darker areas. The Fill light can be tinted a certain color to produce certain effects. For example, in photography the Fill light might not actually be a light, it might be a large gold disk that throws a warm light back onto the subject.

Do the same now, duplicating the light, and swinging it around to the back of the object. Name this object Backlight. We can use a higher Multiplier value on this light, something between 1 and 2, as its main job is to stop the model fading into the background. It picks out the forms on some sides of the object and in certain cases can produce a halo-like effect. Drag this light down so it's almost directly behind the character, but leave the light target where it is (**Fig.11a – 11c**).

Fig 10

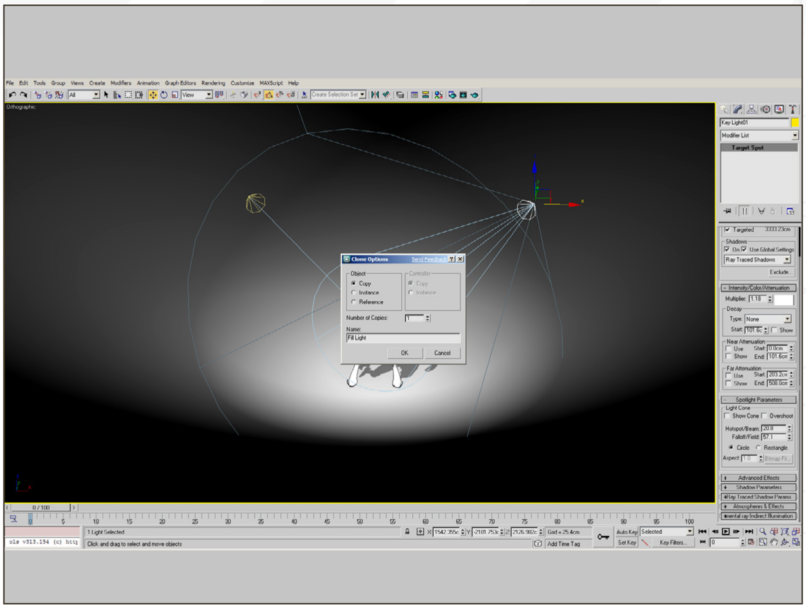


Fig 11a

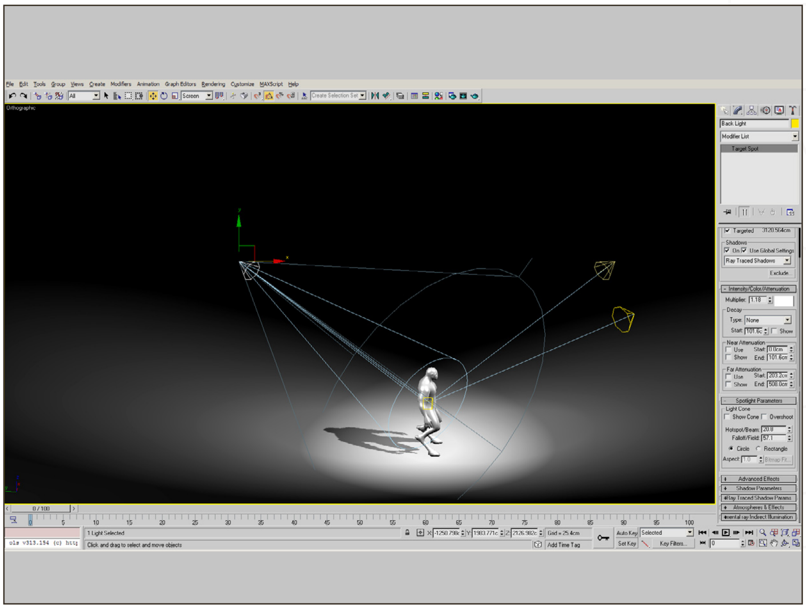
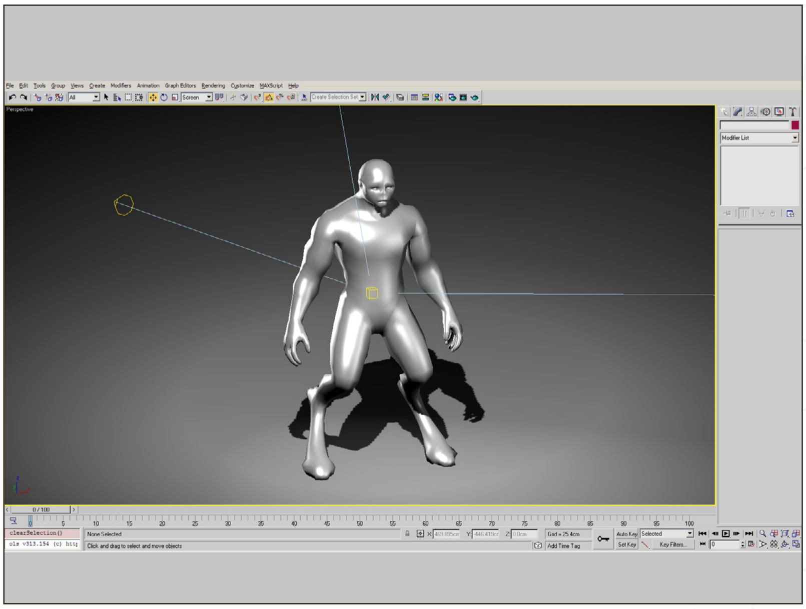


Fig 11b



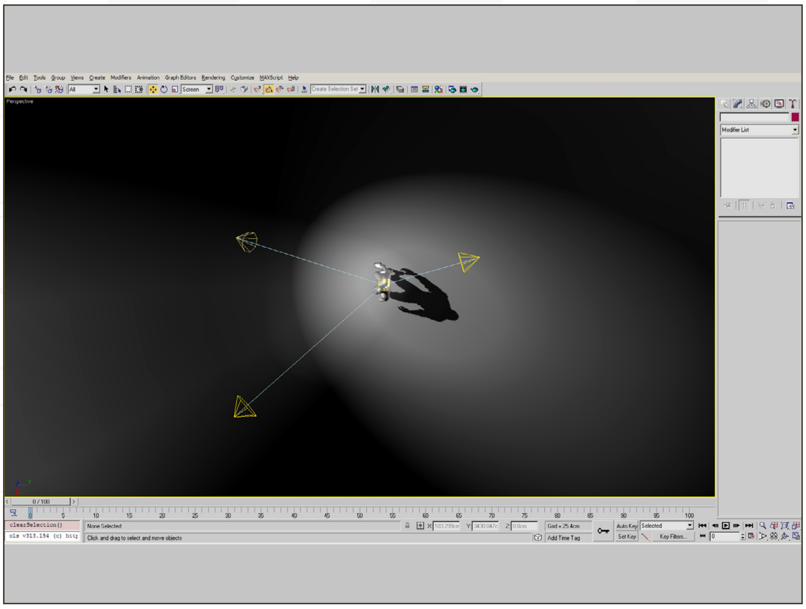


Fig 11c

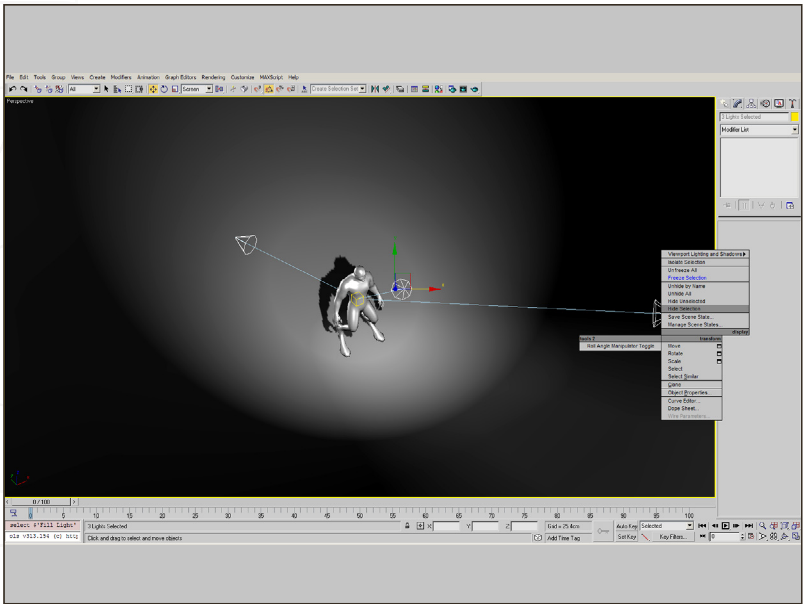


Fig 12

12. Now we can begin creating a simple texture setup. Hide the lights by choosing each one and clicking Hide Selection (**Fig.12**).

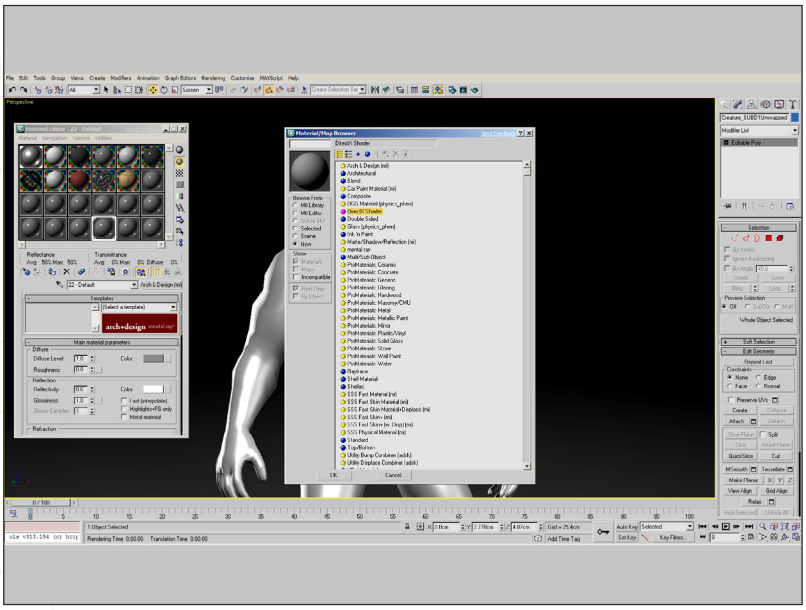


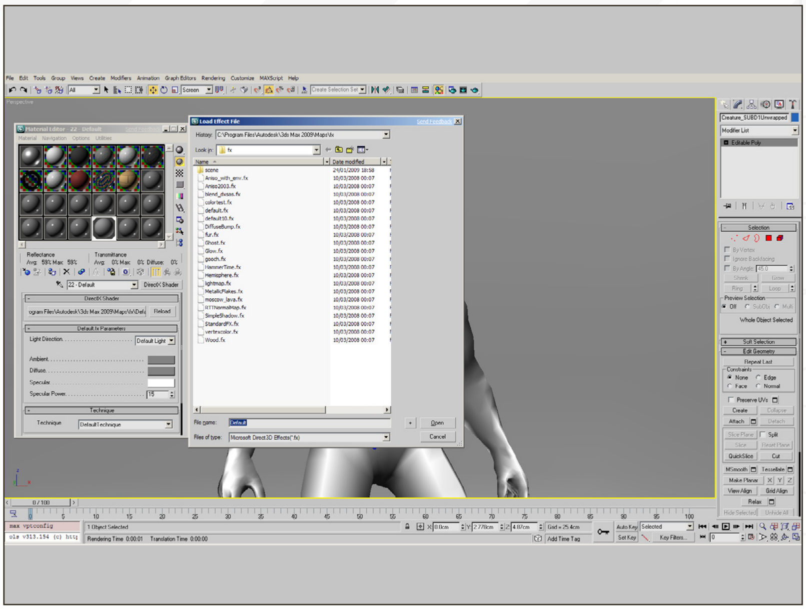
Fig 13

13. Select your character and press M on your keyboard. When using Max 2008 all of the default shaders in the material editor are of the Arch & Design nature. Select one that's not being used and click on the small empty box next to the color swatch. Up will come the Material/Map Browser. From the list, choose DirectX Shader. Realtime shaders have a small pink ball next to them, yellow ones being Mental Ray shaders, and blue being standard materials (**Fig.13**). Click OK.

14. Now that the DirectX Shader has been applied to the Arch & Design diffuse slot we can make changes to the shader. If you click on the box next to Reload, this is where we can load in our FX shaders. FX files are essentially coded descriptions of shaders and can be used to simulate a lot of different effects, from subsurface scattering, to fur, to metal. You can either load one from the Effects Directory that ships with Max, or we can load our own.

From the Max/Effects folder in the Max 2009 directory, choose StandardFX.fx shader. This file comes with Max 9 onwards, as well. Once the shader has loaded you will notice a bunch of new options. As this shader will only be used for testing, limitations are not important, but I will point out that this shader can only support one light, so our three-point lighting setup will not be visible on this shader. Under Light Position, for now select the Key light (**Fig.14**).

Fig 14



15. Let's load in our diffuse texture now, using the Top Diffuse section of the shader. Make sure the checkbox is ticked so it shows up. You can also take this time to enable Viewport Shading so we can see a cast shadow on the ground. This helps to give weight to our character while creating our shaders. Make sure that the shader is applied onto your model already by clicking on the Assigned to Selection button in the Material Editor (**Fig.15**).

Fig 15

16. Now un-tick the Top Diffuse checkbox; we are going to add our normal map and it's a good idea to view it in isolation to see any problems. Decrease the specular color down to a very dark gray, as otherwise it just looks overblown. Scroll down, find Normal Map Enable, and then check the box next to it so our normal map will load (**Fig.16**).

Fig 16

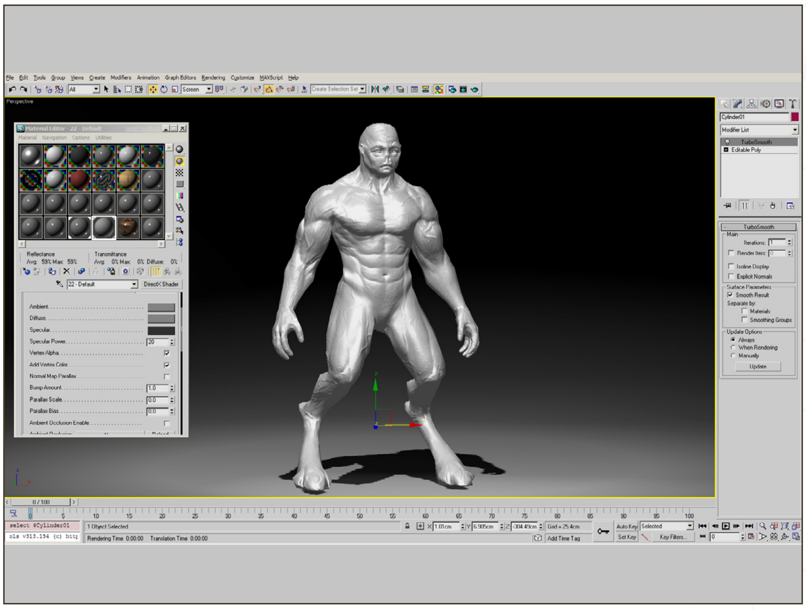


Fig 17a

17. We can also view them both together. Alter the Specular color and Specular Power, and add our Ambient Occlusion in. However far you go with this is your decision. You can either use this for creating your final images, or you can go ahead and follow the second part of our shader tutorial, covering Shader FX to create a more advanced, realistic shader (**Fig.17a – 17b**).

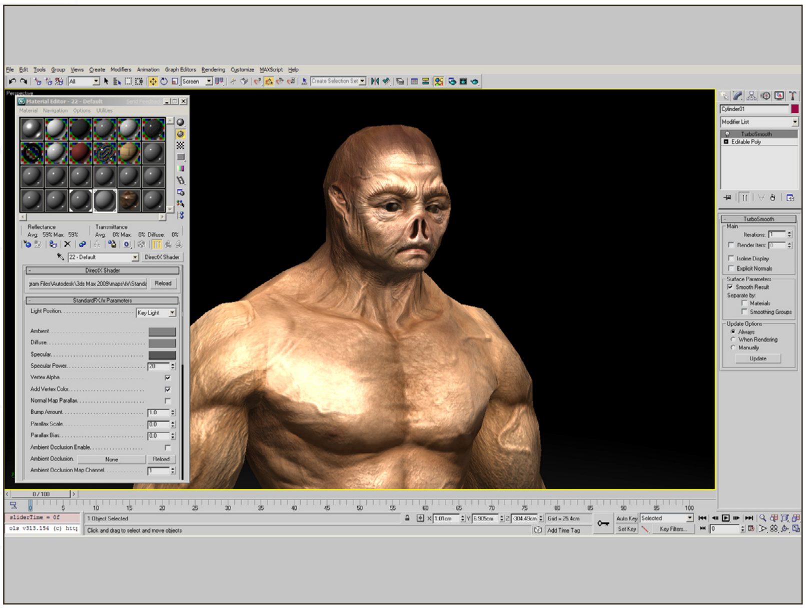


Fig 17b

PART 2 – SHADER FX

18. Moving on to the next section, we're going to cover shader effects. Shader FX is a brand new plugin from Lumonix and lets us create advanced realtime shaders in Max without any prior programming or shader writing knowledge (having said that, an understanding of mathematics comes in handy if you want to create more technical shaders).

Download and install Shader FX for your version of Max from the Lumonix website at http://www.lumonix.net/shaderfx.html. Note: To download and run the free version for individuals and companies smaller than two employees, you just need to scroll down to the bottom of the before linked page, enter your email address in the box, and click to download.

Realtime shaders have come a long way in the last few years. From simply displaying diffuse and normal map information, we can now simulate sub-surface scattering, anisotropy, and complex water, amongst other things.

Reload Max and load up your character (**Fig.18**).

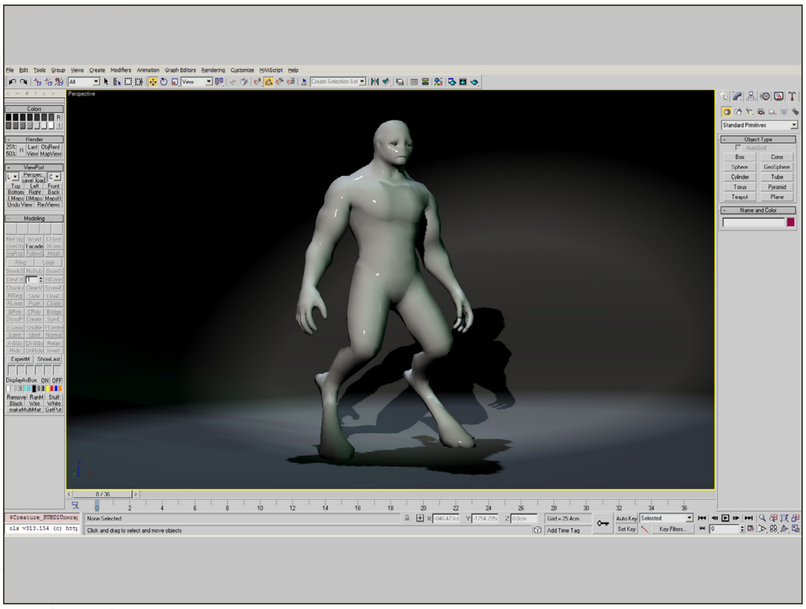
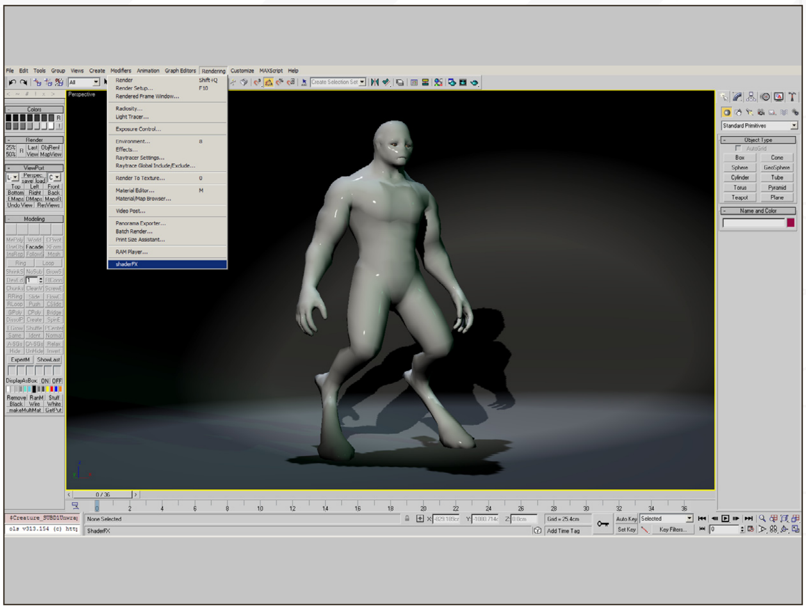


Fig 18

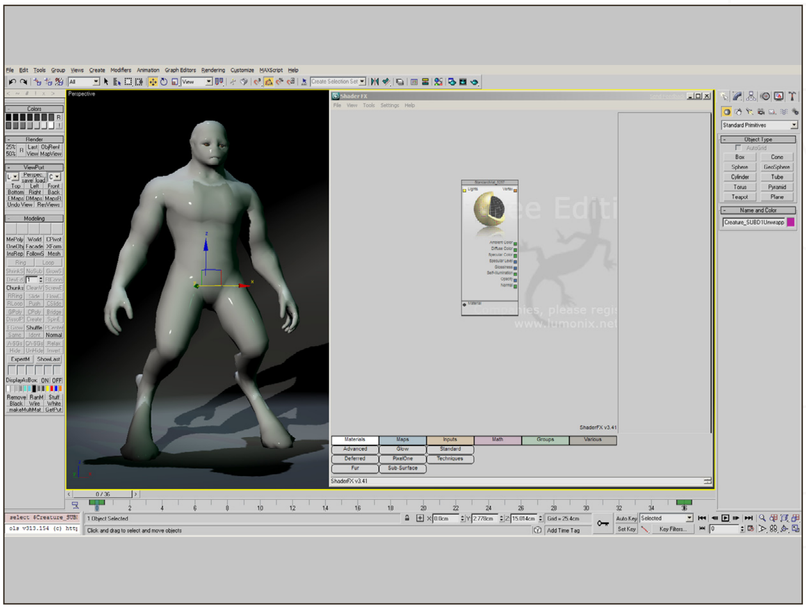
19. We access Shader FX through the rendering menu, as opposed to the Material Editor, so go to rendering and click on shaderFX (**Fig.19**).

Fig 19



20. A Shader FX window will pop up. Scale the window and place it on the right-hand side so we can still see our full character. What you will see in the Shader FX window is a menu bar, a standard material, and at the bottom are all of the nodes that we can use to create our shader. The nodes are split into six groups, and what each node does can be viewed in detail in the help files. During this tutorial I'll only be explaining the nodes that we will be using, but I certainly encourage you to experiment and research the other nodes and see what funky effects you can create for yourself (**Fig.20**).

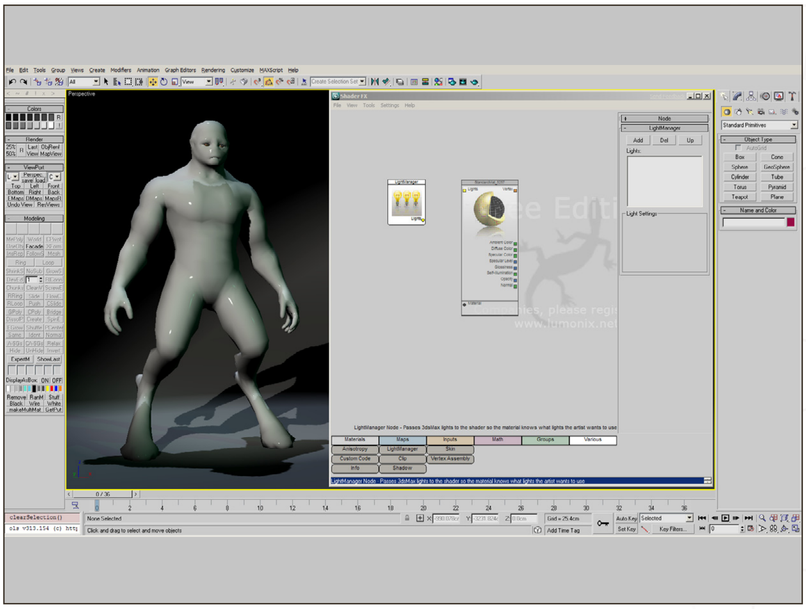
Fig 20



21. First off all, we want to get our shader to accept three lights, so go to the Various tab, the Various Node group, and drag Light Manager from the Node list onto the workspace above. Now click on the Light Manager that we dragged onto the workspace and you will see its parameters on the right-hand side.

We need to add our three spotlights into its list, so do that now. Click on Add, and then select each light. You will need to click Add each time (**Fig.21**).

Fig 21



22. Now is a good time to save our shader. Click on the File menu in the Shader FX window and

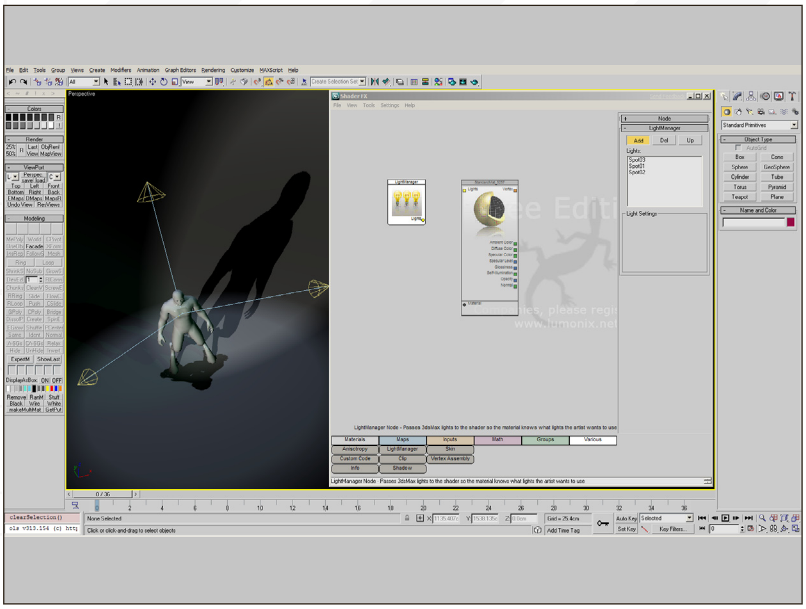


Fig 22

click Save Project. Give it a name and click OK. Then again in the file window, select “Save 3DS Max File Shader”. Under the Tools menu, click Tools > Assign Material to Selection. Our material is now on our character (**Fig.22**)

23. We create shaders in Shader FX by linking together nodes – each node doing a specific job. To link a node you connect its output into another node’s input. Do this now with the lights. Drag from the yellow circle in the Light Manager mode to the yellow box in the top left of the main material. You will notice our object is now white, as we have not assigned any texture maps or colors to it yet (**Fig.23**).

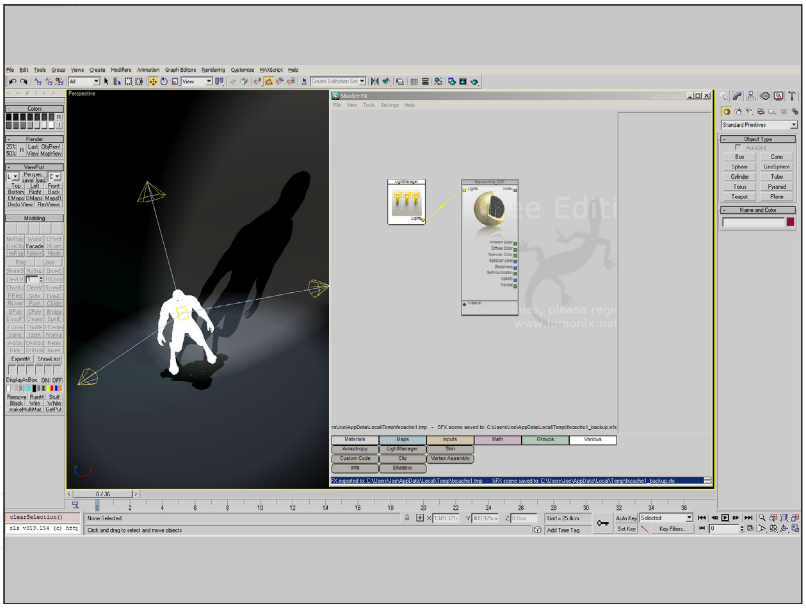


Fig 23

24. Let’s apply our diffuse texture to the model by first selecting the Maps group under the nodes menu, and then dragging and dropping Texture Map onto the workspace. Each texture map node can be used for multiple texture types, including normal maps. Select the newly created node and click on the three dots under the naming box. This will allow us to specify a particular texture that should be used. Select your diffuse map, exported from our Photoshop character texturing file.

Under Standard Semantic we can give our node a title, specific to the type of map being used. Drop down the menu and select Diffuse Map. You can also take this time to alter the UI name. It can be useful to name everything according to its job, to make navigating the workspace easier later on once we have multiple nodes in place.

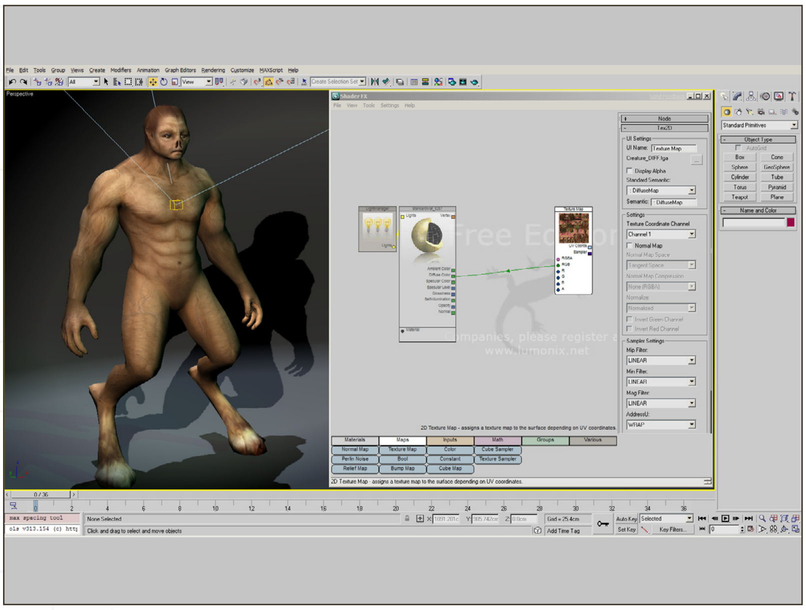


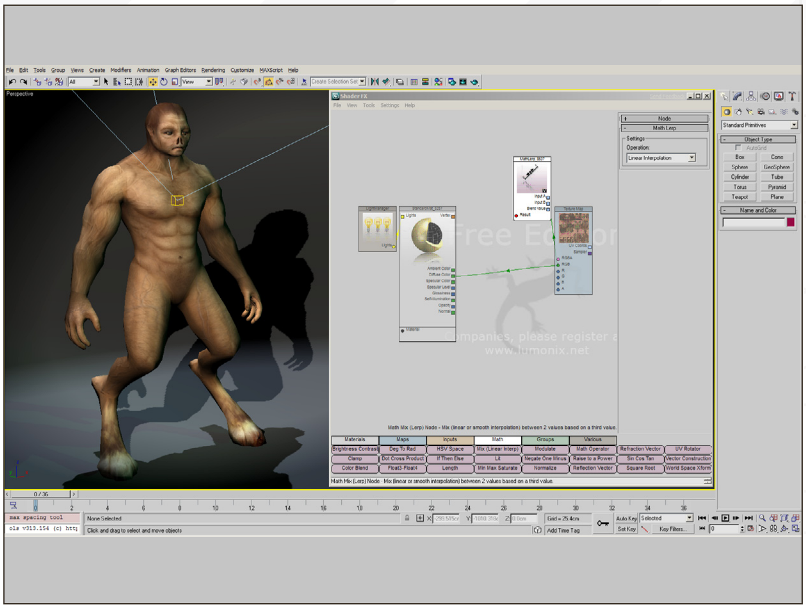
Fig 24

Now connect the texture map to our material. Drag from the RGB slot of the texture map to the diffuse color slot of the material. Sometimes you may get a slot mismatch error because the type of feature might need a value rather than a color. You can make sure you don’t run into this problem by looking at the colors of the boxes next to the feature. Next to Diffuse Color is a green square, which means it connects to green circles. Our RGB slot is a green circle so we know they will match up (**Fig.24**).

25. Switch to the Math Node group, and drag and drop a Mix (Linear Interpolation) node onto the workspace. This particular node takes two values, Input A and Input B, and blends them together using the input in the Blend Value slot. The Mix (Linear Interpolation) is used to blend between two colors or textures by using a mask. The mask needs not be a texture, however, it could be a Fresnel calculation, or a value based on depth or height.

Connect your texture map to the Input B slot of the MathLerp (Mix (Linear Interpolation) node (**Fig.25**).

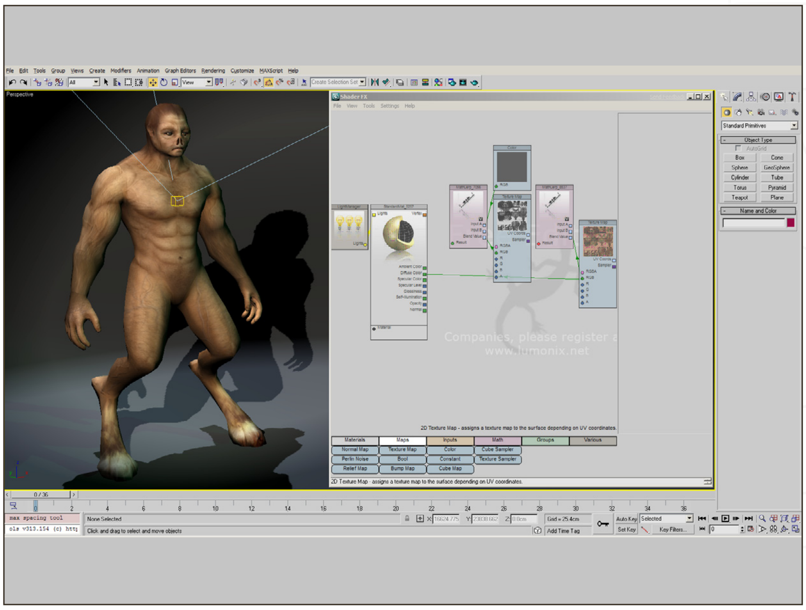
Fig 25



26. Now drop in another MathLerp node, a new texture, AP node, and from under the Maps group, drop in a new Color node. The Color node is simply a flat color that we define. Click on the Color node now and open the color swatch. Choose pure black and click Set. Unlike some other nodes in Shader FX which update automatically, the Color node only updates once you click the set button.

Connect the Color node into the Input A of our new MathLerp node. Connect the Blend Value to the RGB slot of the new texture map node. Click on the texture map node now and change its Standard Semantic to Specular Map. You should also rename it, and load in your exported specular map (**Fig.26**).

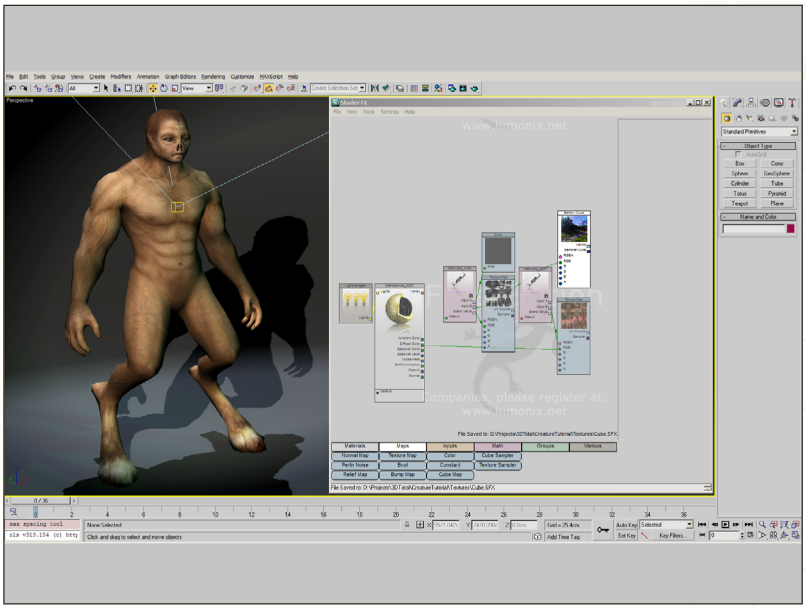
Fig 26



27. We want to be creating a reflection on the edges of our object, as in real life when you look at grazing angles of any object they are more reflective. We are using our specular map here to mask the reflection that will occur, so darker, drier, and more recessed areas do not catch any reflection.

Under the Maps Node group, create a new cube map now. Choose a cube map from either the Shader FX directory or browse for one online. There are plenty of locations to download cube maps. The limitation here is that it must be in DDS format.

Fig 27



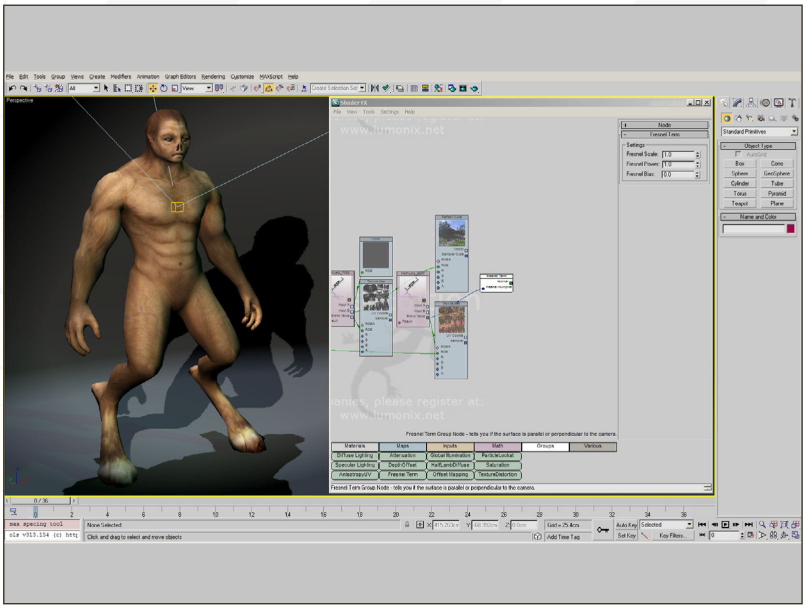


Fig 28

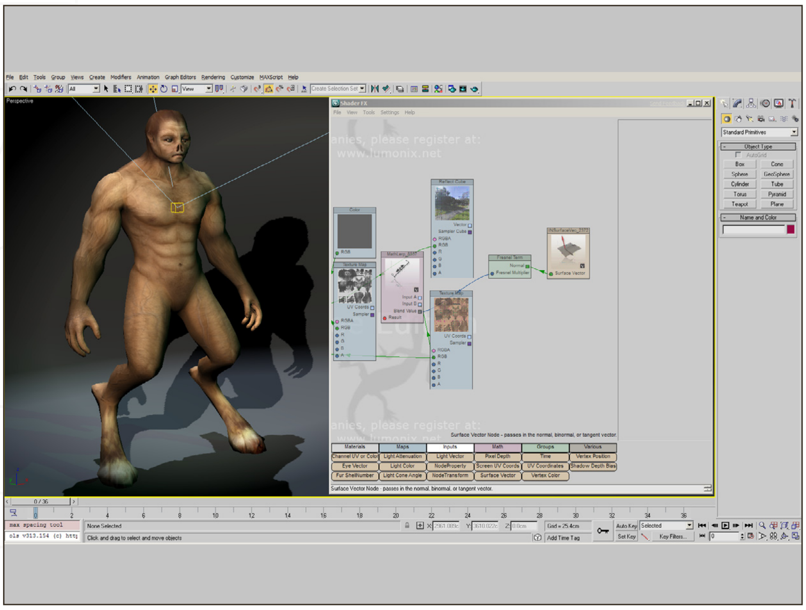


Fig 29

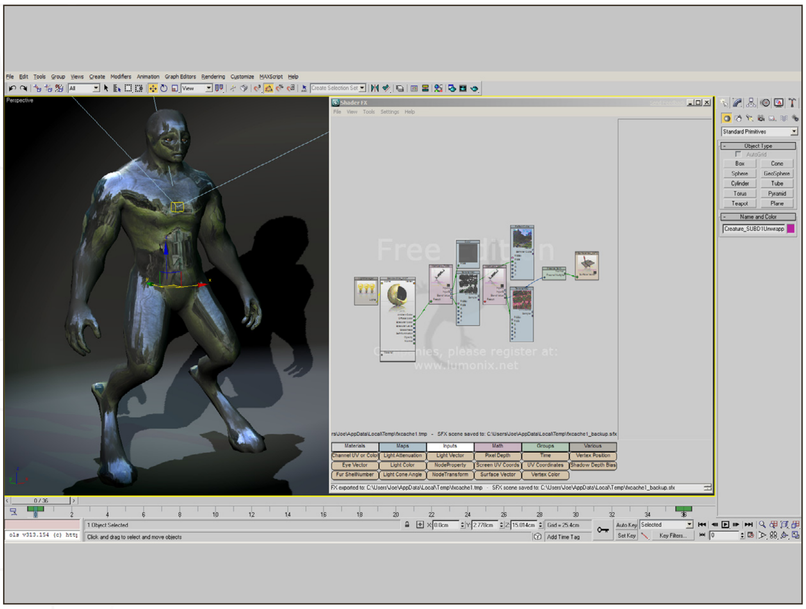


Fig 30

Connect our new cube map's RGB slot into the Input B of our second MathLerp node. Here's a brief explanation of how the last few steps will affect our model:

The cube map is going to produce our reflection. It, however, needs to be masked by the specular map for the reasons we stated above. Therefore, we plug it into the Input B channel of a MathLerp node. In the Input A slot we plug in a Color node that has a color value of pure black. This equates to zero reflection. In the blend value slot we plug in our specular map, which here acts as a mask. Areas of the map that are white are passed through to the cube map, and thus reflection. Areas that are black are passed to the black Color map and have no reflection (**Fig.27**).

28. Now we have the reflection masked, we want to make sure it only happens on the edges, or grazing angles of our object. To do so, we must use a Fresnel Term, found inside of the Groups Node group. Node groups are a bunch of various nodes all collected under one group. Through the Tools options you can expand these and look at their components, but for efficiency and speed they are grouped together. Change the settings of the Fresnel Term to be as follows: Fresnel Scale 0.9, Fresnel Power 0.0, and Fresnel Bias 0.0. The higher the Fresnel power is, the more of the object will be reflective. The scale determines how strong that reflection is and the bias shifts this scale up and down.

Plug the Fresnel Term into the blend value of the first MathLerp node (**Fig.28**).

29. Under the Inputs Node group, create a Surface Vector node. We can use this to get our normal and pass it into the Fresnel Term. This is an important step into making sure the Fresnel Term gets the right information it needs to be accurate (**Fig.29**).

30. Instead of the diffuse texture map being plugged directly into the diffuse color slot of the

material, plug in the second MathLerp nodes Result slot. The object now shows up as fully reflective, being masked only by the specular map. We are not getting any diffuse color information because our map is not yet plugged into the right channel (**Fig.30**).

31. Plug the result of the second MathLerp node into the Input A slot of the first MathLerp node (**Fig.31**).

32. All that's left to do is to plug this MathLerp node directly into the diffuse color slot of the material. It's a good time to clean up your workspace. You can double-click on nodes to switch on their compact form, saving space.

Another addition to a good character shader is having the edges of our object a little brighter than the rest of the model. When the character is in a dark environment without any lights, it can be beneficial if he still picks up a little rim light, just to pick out the character so the player knows he is there. It also serves to stop him blending in with the background when they are similar colors.

Create a new MathLerp node, two Color nodes, a Surface Vector node and another Fresnel Term. Set up the Fresnel Term as before and plug it into the Blend Value slot of our MathLerp node. Plug the two Color nodes into the Input A and Input B slots.

We can now plug the MathLerp result directly into the Ambient Color slot of the material. Alter the Input B color swatch to be black, as this will equate to no ambient color contribution. The other swatch can be altered to your liking. White and bluish values look best, giving a small global illumination look. Values like green and red can be used for effect (**Fig.32**).

33. Our character still needs some kind of specularity and shininess to his skin. Under the Maps Node group, create a Constant node. This is simply a node that passes a numerical value.

Fig 31

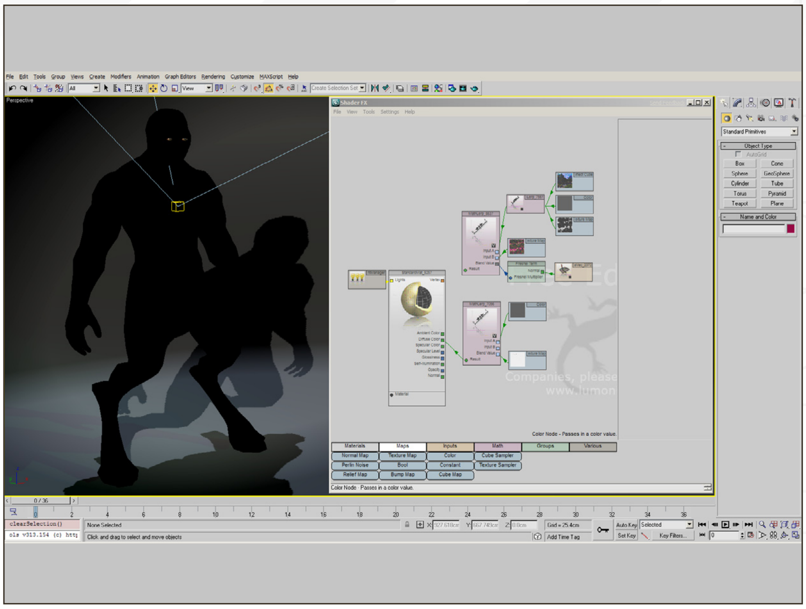


Fig 32

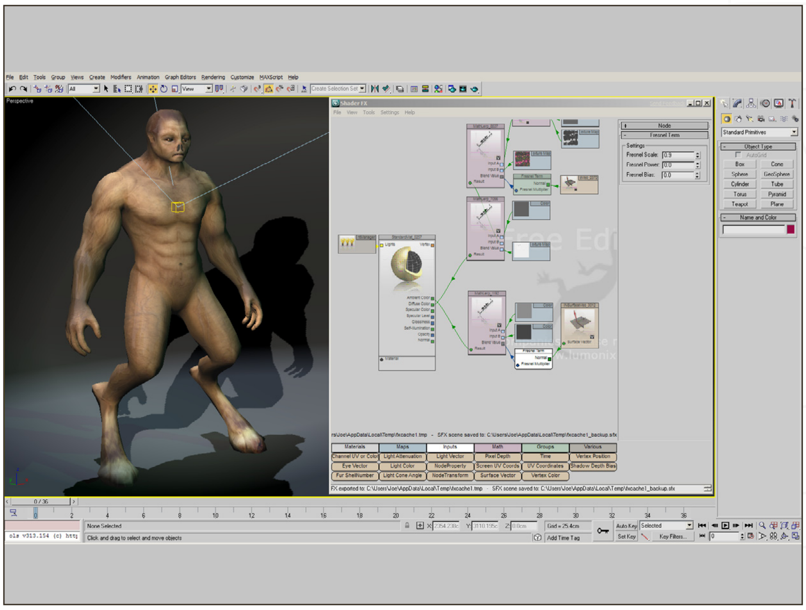
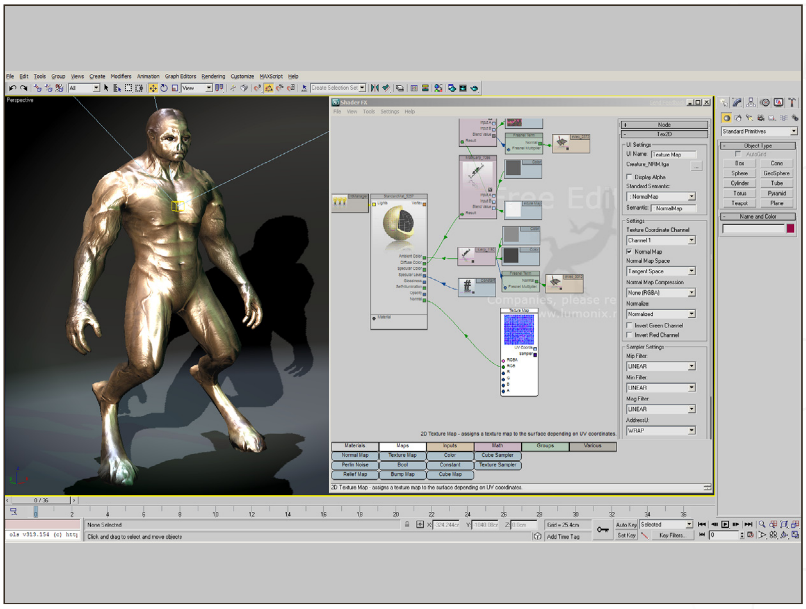


Fig 33



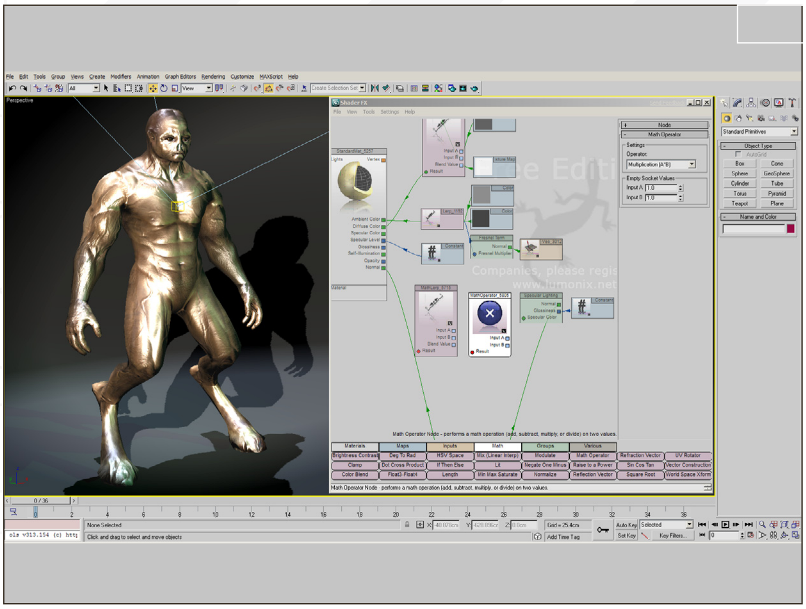


Fig 34

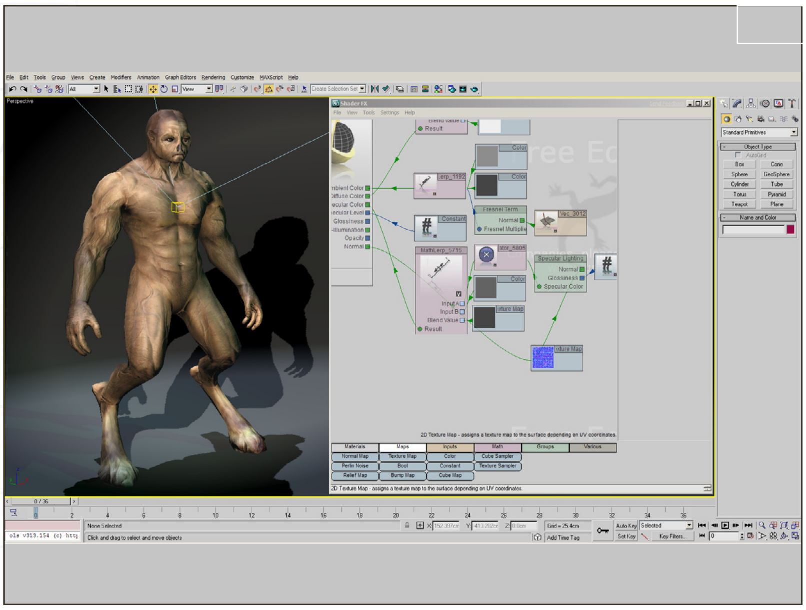


Fig 35

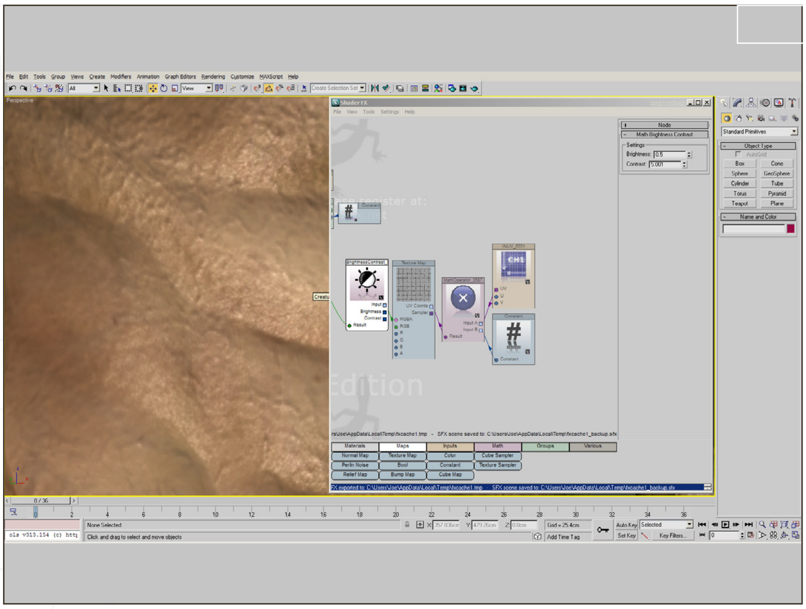


Fig 36

Set its value to 1 and plug it into the Specular Level slot of our material.

We should also create a normal map at this point, so we can see how well our specularity settings work. Create a new Texture Map node and open its settings. The difference here is that we will turn on the Normal Map checkbox so the material knows to treat it as such. You can name it and give the correct semantic, also. Plug its RGB into the normal slot of the material now.

Depending on the application you generated your normal map from you may notice errors at this point in the way the normal map is reacting to the lighting. In some cases you will need to click the Invert Green Channel or Invert Red Channel checkbox to flip one of two of the co-ordinates in the map. You can make doubly sure by turning off all but one light in your viewport, positioning it overhead, and looking at the shading cast by the protruding areas of your normal mapped model. Check that, for example, when the light is overhead, the abdominal muscles are darker at the bottom and lighter at the top. Also check the seams of the object. If both of these do not look correct, then Invert one of the normal map channels and check again (**Fig.33**).

34. Now from the Math Node group, add a MathOperator node. This is a node that can be used to apply a mathematical calculation to the data that is passed into it, specifically multiplication, addition, division and subtraction. We are going to use it to multiply a tileable and a non-tileable specular together to produce a value to input into the Specular Level slot of the material.

From under the Groups Node group, add a Specular Lighting node. We have two inputs with this node: Normal and Glossiness. The first value can be gotten by plugging it into the RGB of our Normal Map node. The second, which controls the sharpness of the highlight, should

be passed from a Constant node. A value of around 10 produces a good sized highlight for us. Higher values increase the sharpness and decrease the size of the specular, and lower values increase the size and diffusion of the highlight (**Fig.34**).

35. Create one Color node and one Texture Map node. The Texture Map will be used to define where there should be no specular, so either paint a specific map for this, or use our exported specular map. Plug the two nodes into the MathLerp Input B and Blend Value slots. Plug the MathOperator into the Input A. The resulting specular color from the specular lighting node should be passed into the Input B slot of the MathOperator node. Plug the MathLerp node into the Specular Level of the material (**Fig.35**).

36. Let's create our tileable specular now. Open the skin tile we used to create our diffuse map and save off the grayscale version, before we convert it into a normal map. Add this to our workspace within a Texture Map node. Create another MathOperator node. This will be plugged into our UV Coords of our Texture Map. If no UV Coords are specified, then the shader will use the default ones from the object. However, we will be tiling our specular and therefore we need to use modified UVs. We cannot plug it in until we have given the MathOperator Inputs, though.

Create a Constant node and a UV coordinates node from under the Inputs node group. Pass the UV information to the Input A of our MathOperator, and pass the Constant value into our Input B. The Constant value will be used to increase the amount of tiling our specular will use. A value of 10 will tile the texture 10 times over our object. A value of 15-20 should be optimal (**Fig.36**).

37. We can now connect up our MathOperator to the UV Coords of the Texture Map. In most cases this should work well, but the tiled

Fig 37

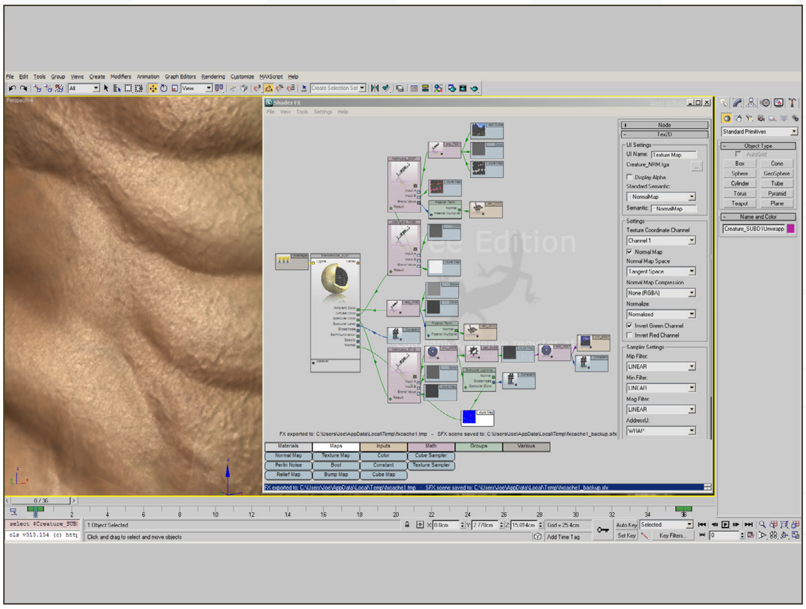


Fig 38a

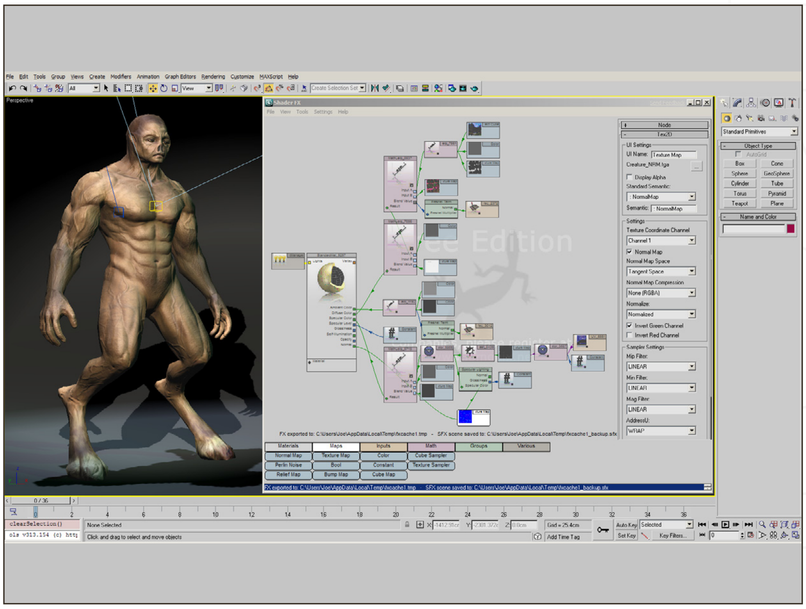
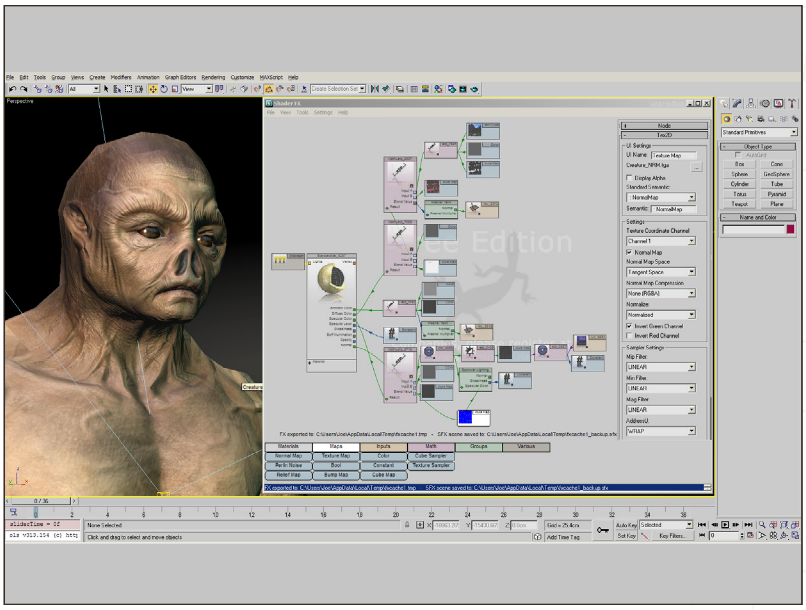


Fig 38b



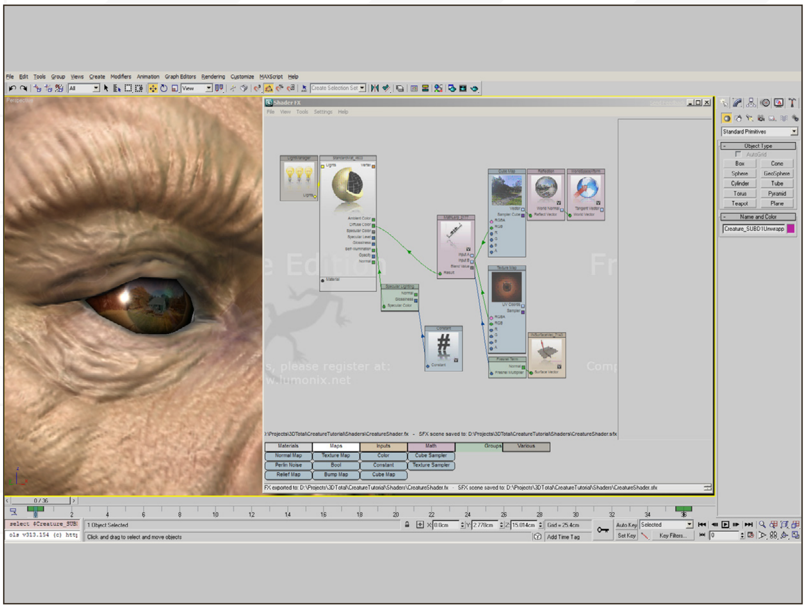


Fig 39

specular will not be bright enough. Under the Math node group, drag and drop a Brightness/Contrast node and plug the RGB of our Texture Map into its Input. We can then plug the Brightness/Contrast node into the awaiting MathOperator that already has our specular lighting node connected to it (**Fig.37**).

38. Congratulations on completing the shader! Our character is almost ready to be exported and put in-game, and now only a few steps remain. It's important to look over the whole character and make sure there are no seam errors, un-welded vertices, or large obvious polygons in the silhouette.

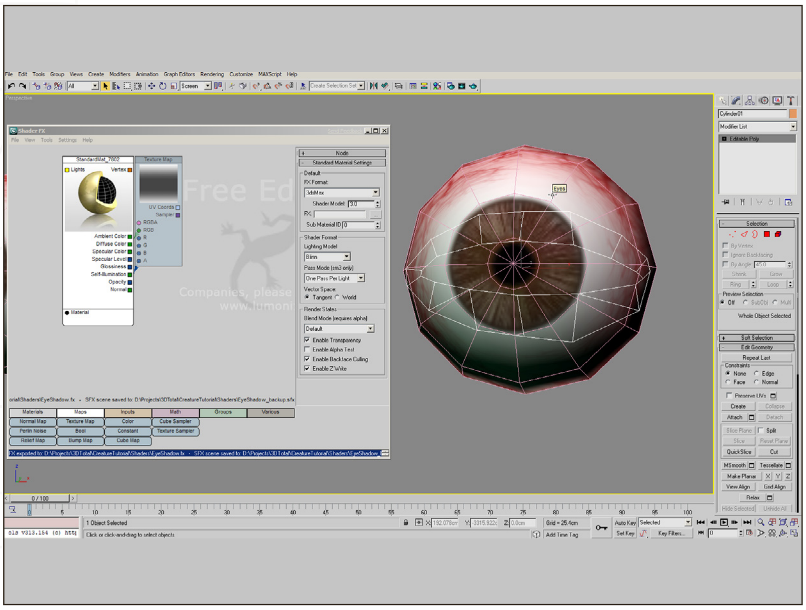


Fig 40

At this point I go over the model and make small changes to the topology, just outlining some major muscles and adding a few edges here and there to increase the size of muscles in the low-poly so they stick out more in the silhouette. Of course, this is a dangerous time to make topology adjustments or divisions, so when doing so keep aware that our normal map was calculated before you made these changes, and any dramatic ones will create inaccuracies in the way the normal map is displayed. Also, in the Editable Poly modifier panel, make sure Preserve UVs is switched on when moving vertices around (**Fig.38a** – **38b**).

39. Save your shader now, and create a brand new one to apply to our eyes. Using the same techniques as in the character shader, build a material that includes a strong small specular, a texture map, and a reflection (**Fig.39**).

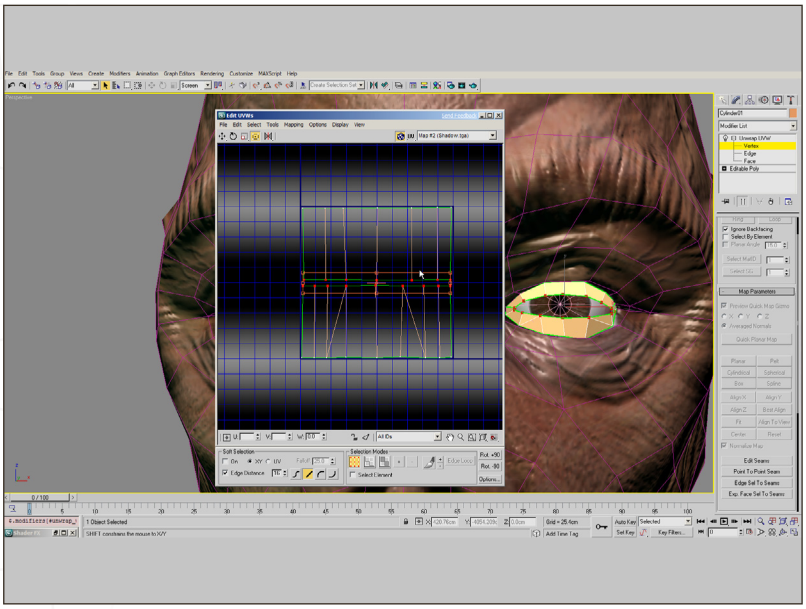


Fig 41

40. They say eyes are the window to the soul. There is some truth in this in relation to our work. The eyes are what people first look at when they see a character's face, so they had better be high quality. Let's look at giving depth and realism to the eyes using a simple trick:

I have created a cap over the eye socket, as close to the eye as possible, using a single polygon. Extrude the edge all around the eye

and match the eye's edge count. Then un-wrap the object with the upper section on the top, mapped out in a rectangle straight form. The same is then done with the bottom (**Fig.40**).

41. Create a new texture in Photoshop, which is essentially pure black. In the alpha channel fade the black into white near the top and bottom of the image, as shown in the screenshot (**Fig.41**).

42. Plug the RGB value in the material's Diffuse Color slot, and the A (Alpha) value into the Opacity slot of the material. Apply this shader to the eye cap. You may need to flip the polygons of the eye cap if it does not show up immediately (**Fig.42a** – **42b**).

Fig 42a

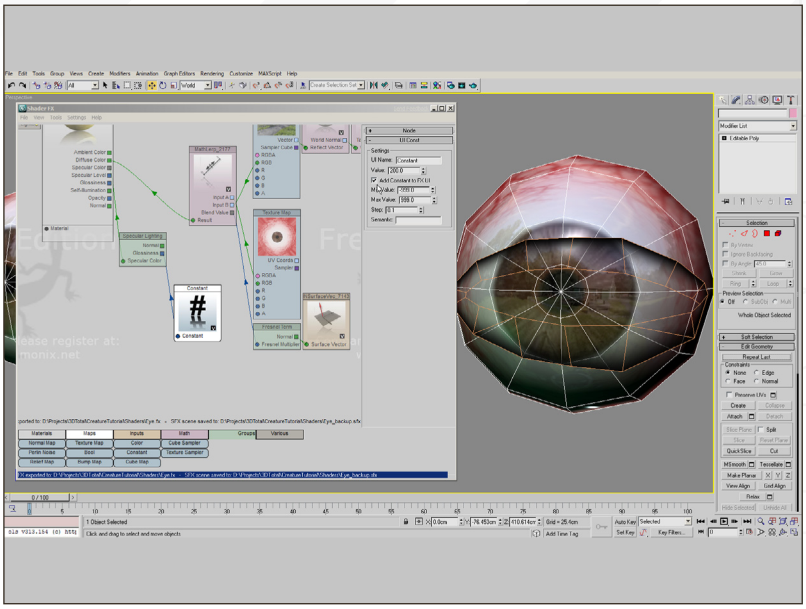
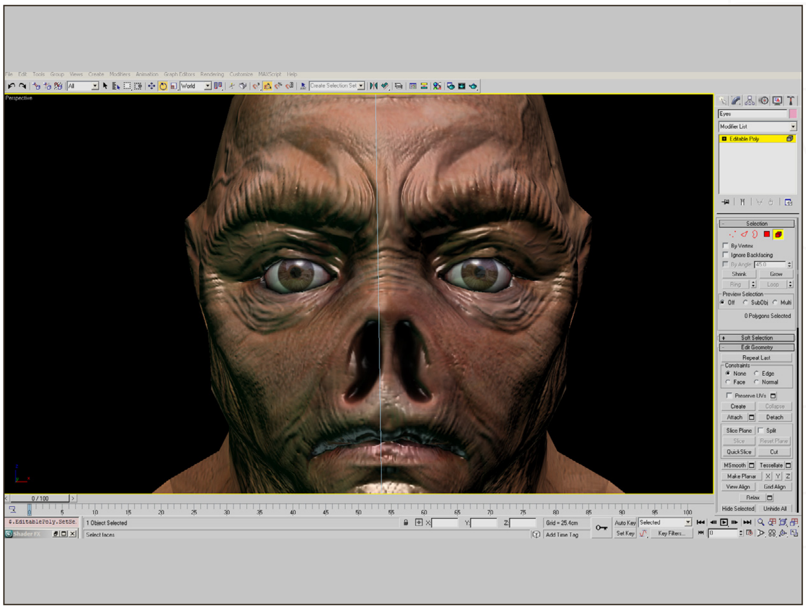


Fig 42b

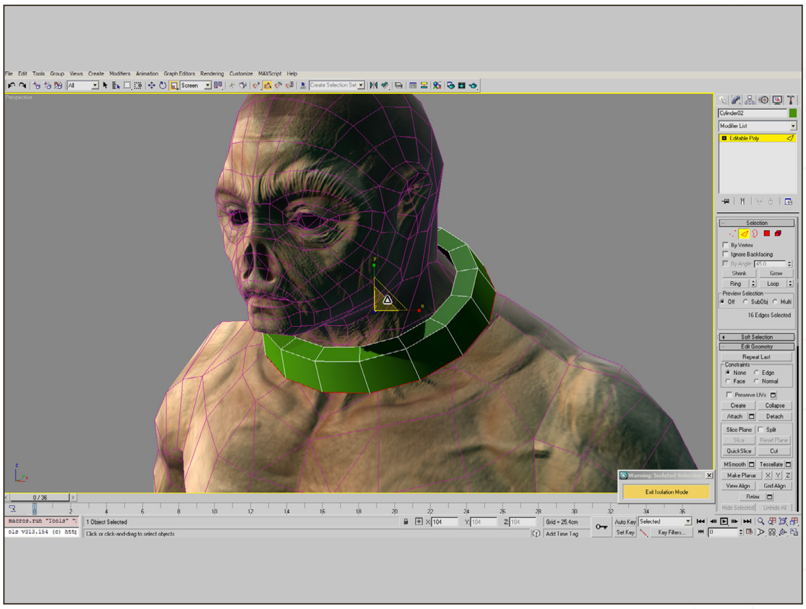


Accessories

As promised, our character needs a few accessories to really sell his slavery/escape story. The concept includes chains and shackles around his neck and on his ankles, as well as a large club weapon, probably used to knock out his owners in his big break to freedom!

We have already created our shackles and chains texture and normal map in the last part and we can safely map any metal parts to this area for a convincing metal textures. During this part you may also build yourself a new shader to simulate metal from within Shader FX. The important aspects of metal to portray in a shader are that the specular is usually tinted the same color as the metal. Tinting the specular slightly blue, either in the texture map or the shader, can look very convincing. Another trait of metal is that the reflections are very rarely uniform, they are of course masked by scratches and dirt, but also most metals are what are known as "anisotropic". An anisotropic object is one that's physical properties are different in one direction than the other. A natural anisotropic material is wood, where the wood is stronger in one direction than the other. Wood workers have combated this by stacking very thin layers of wood on top of each other, rotating the piece 90 degrees each time. What results is an isotropic

Fig 43



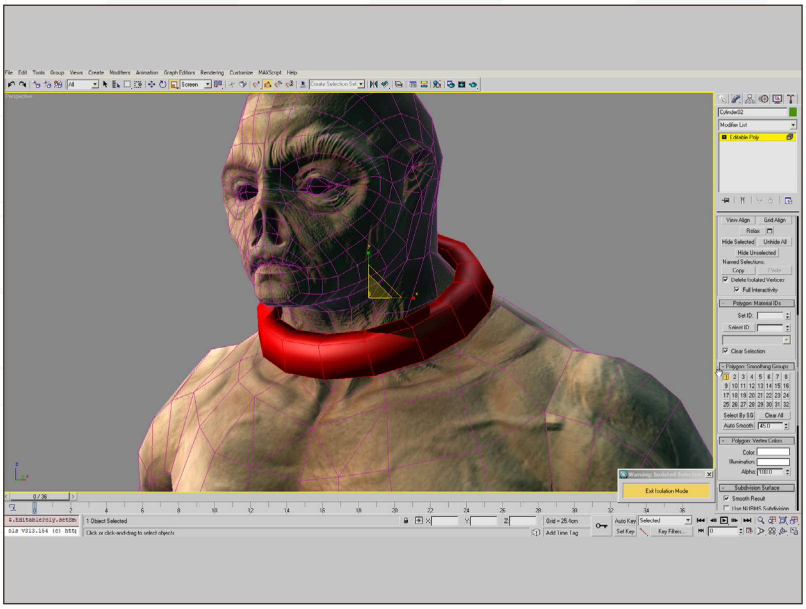


Fig 44

material and one that's quite substantially stronger.

43. Create a cylinder and position it around the character's neck. Make sure it's slightly bigger than the neck to ensure it has thickness. Select the top and bottom polygons and inset them by about four centimeters. Now in the Editable Poly modifier panel, select the Bridge tool. The Bridge tool is a great way to quickly connect two polygons or a set of edges. Instead of extruding and welding edges together for minutes, all of that is done in the click of a button. Commit to the bridge by clicking OK. Select the edge loop on the lower outside of the shackle and scale it out a little (**Fig.43**).

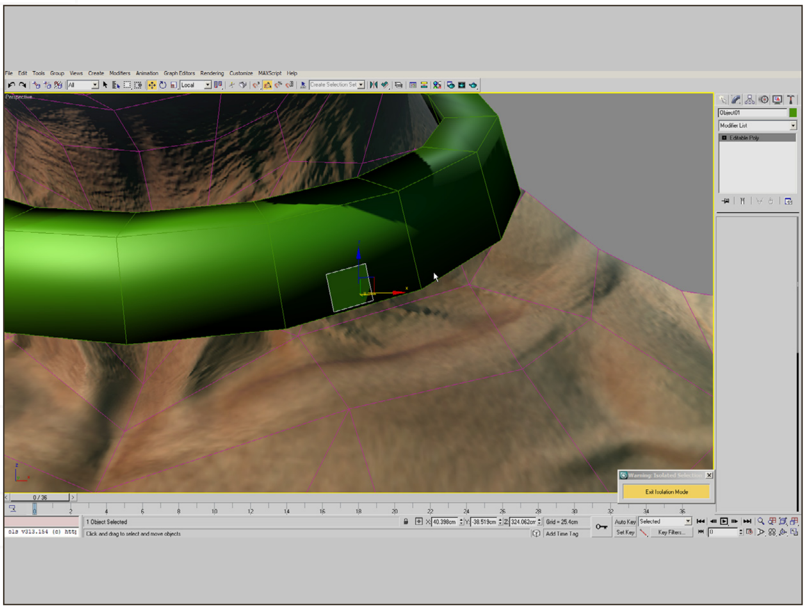


Fig 45

44. Select all the polygons of your object and, as we did earlier in the tutorial, set the whole objects Smoothing Group to be 1. We will use a normal map to pick out the hard edges of the object, so smoothing groups will not be necessary (**Fig.44**).

45. Create a new plane object and position it right up close to the shackle. Make sure it's at least a third of the size of the shackle polygons (**Fig.45**).

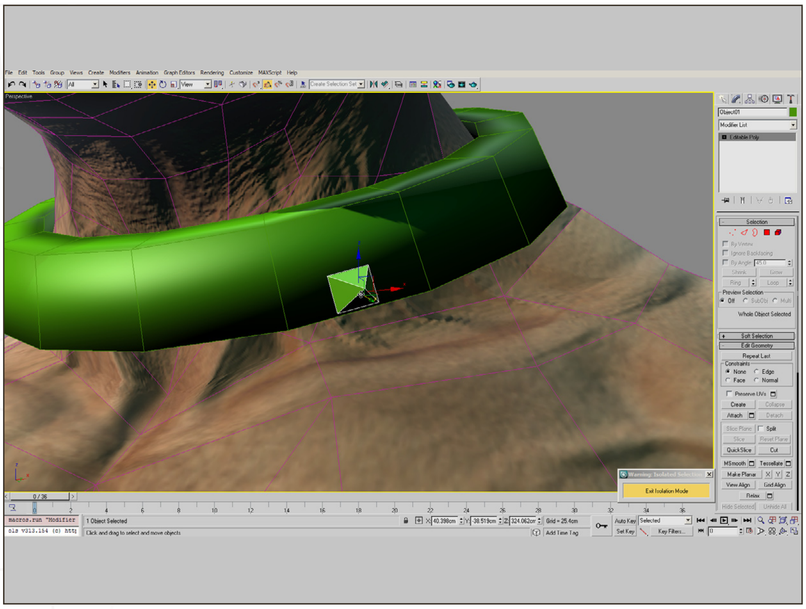
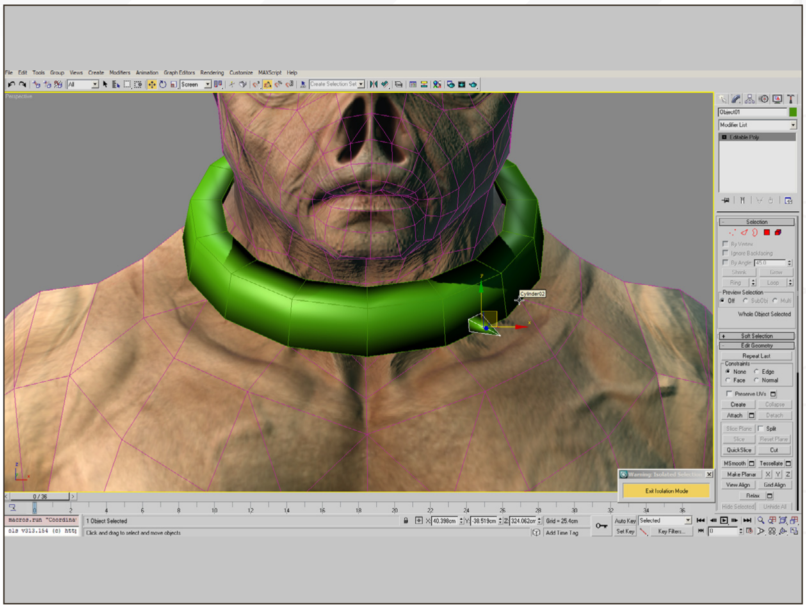


Fig 46a

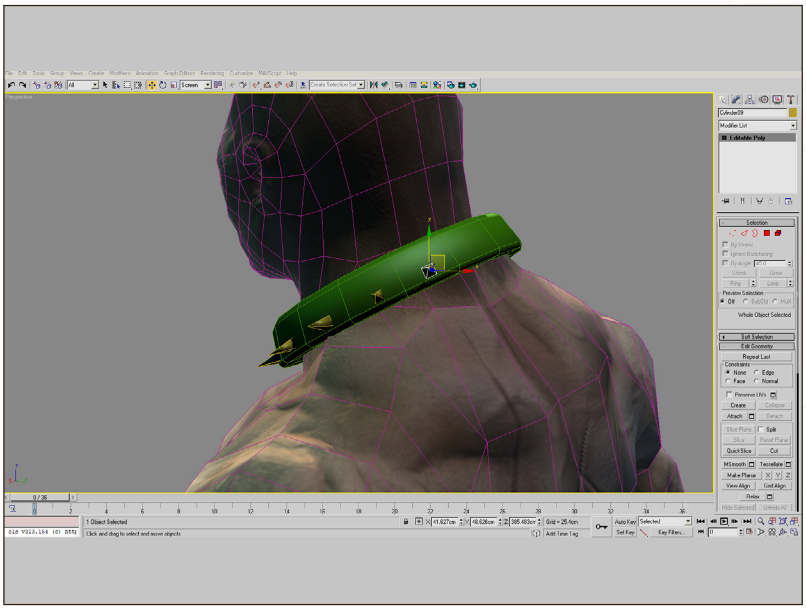
46. We want to be extruding the polygons of our plane now, and then collapsing it to form a prism (**Fig.46a – 46b**).

Fig 46b



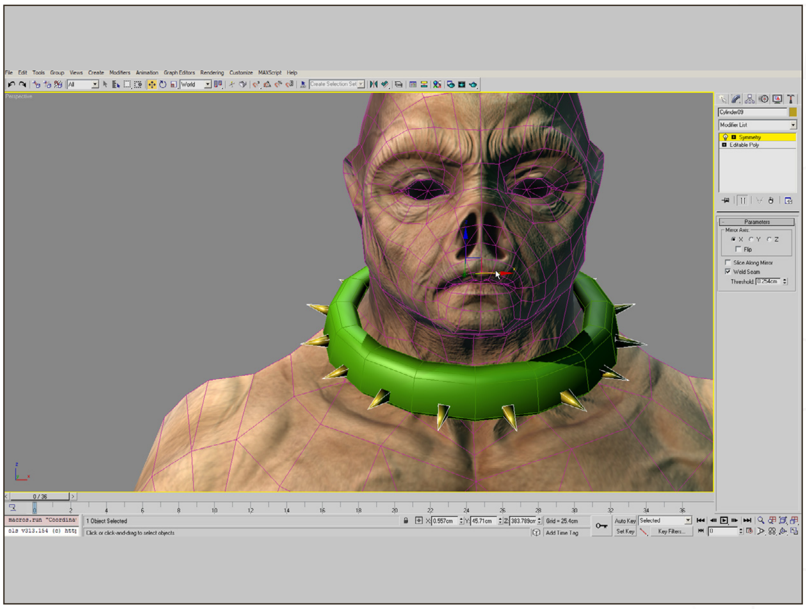
47. Duplicate this object onto every face of your shackle. These spikes will be all around our object and don't look too friendly. I hope they will give the shackles a meaner and more controlling feel (**Fig.47**).

Fig 47



48. Once you have duplicated this object all around one side of the model, we can apply a Symmetry modifier to speed things up. Make sure all spike objects are one, by selecting one of them and in the Editable Poly modifier panel clicking Attach. Click then on each spike to add it to the object (**Fig.48**).

Fig 48



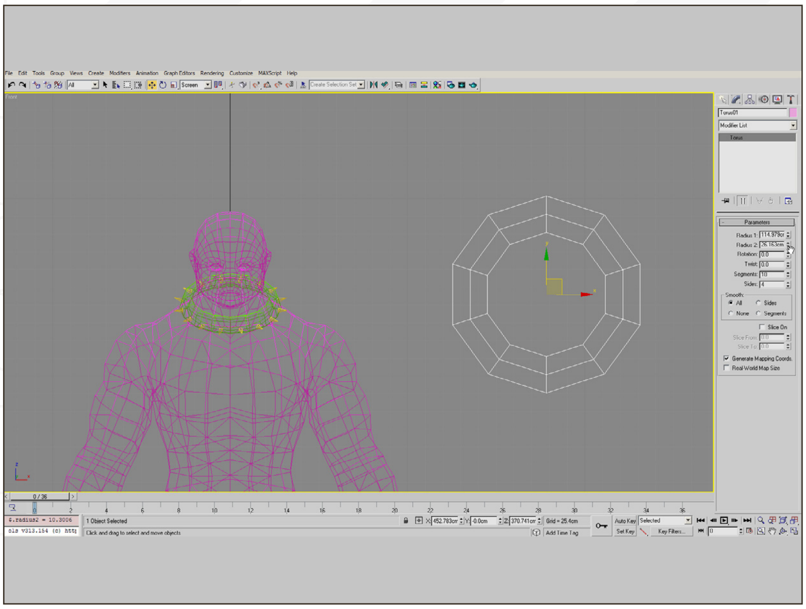


Fig 49

49. Now create a new object to be used for the chains. We can use a Torus primitive with the settings shown in the screenshot. A side count of 4 will make the object square, but as it's twisted 45 degrees and has only one smoothing group, it will look circular (**Fig.49**).

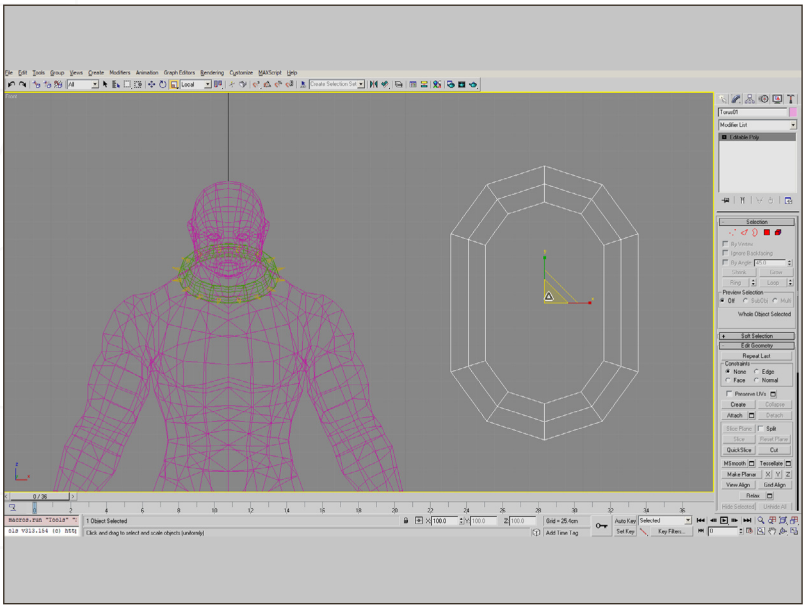


Fig 50

50. Convert this primitive into an Editable Poly object. Select the lower half of vertices and drag them down. Quite quickly we have a chain link shape (**Fig.50**).

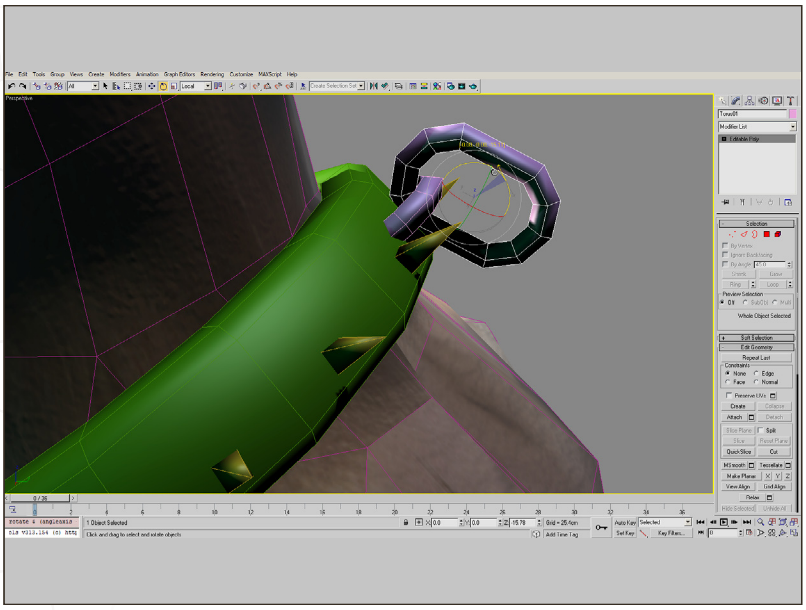
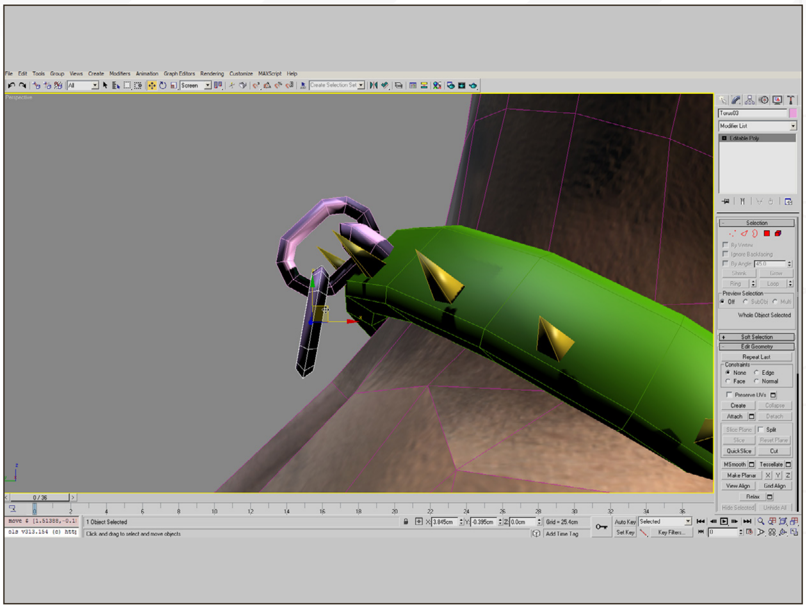


Fig 51

51. Duplicate the chain link and delete half of it – we can position this half intersecting with the back of the shackle, to act as a hook point for the length of chain that hangs down his back. Use the original chain link and position it as shown (**Fig.51**).

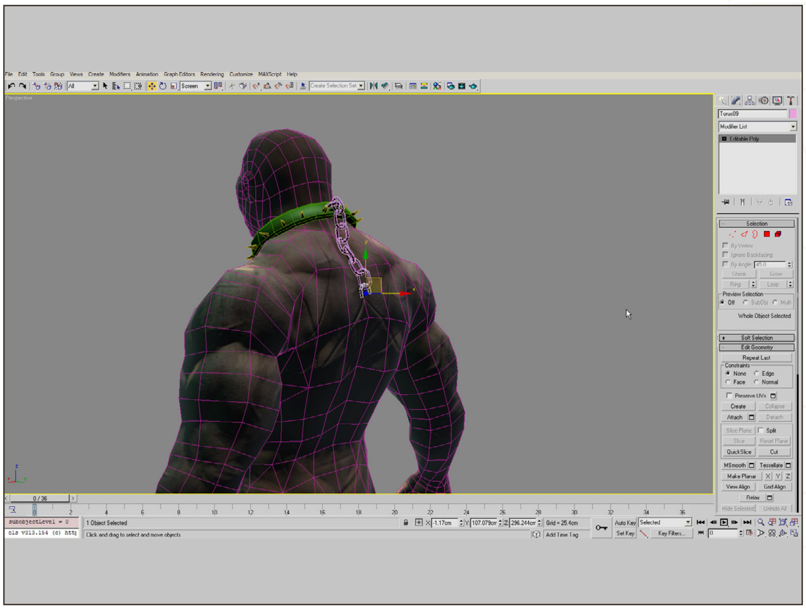
52. Duplicate and position another chain link into place. It's quick to Shift-and-drag your object to create and position a new one. You can in this case choose Instance if you want to make sure your changes to the original chain link are carried over to all the duplicates (**Fig.52**).

Fig 52



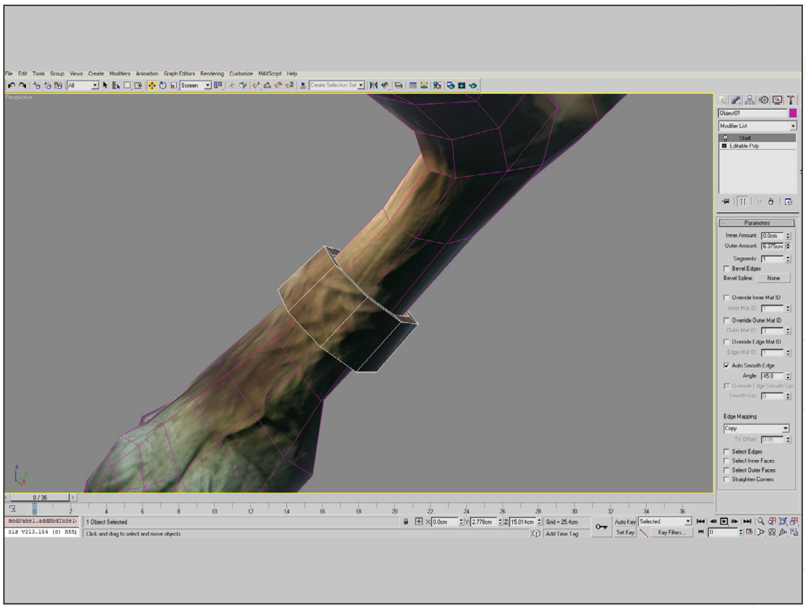
53. Create the rest of the chain now. Try to get the chain flowing down the back and imagine that it's being affected by gravity. Also bear in mind the solid nature of the thick chain links and how they would react with each other (**Fig.53**).

Fig 53



54. Moving onto the foot shackles, select some polygons on our actual character mesh – a loop around the ankle, to be specific. Detach these polygons as a clone mesh and using the Shell modifier give them thickness (**Fig.54**).

Fig 54



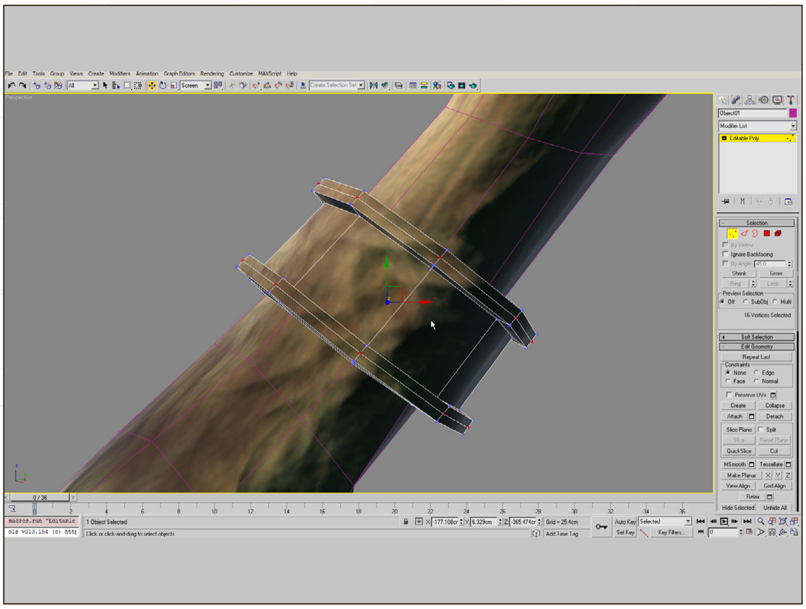


Fig 55

55. Add two edge loops to the new mesh to form three rings of polygons. Select the outer two and extrude them. Add another edge loop to the middle of this extrusion, and then select all of the vertices shown (**Fig.55**).

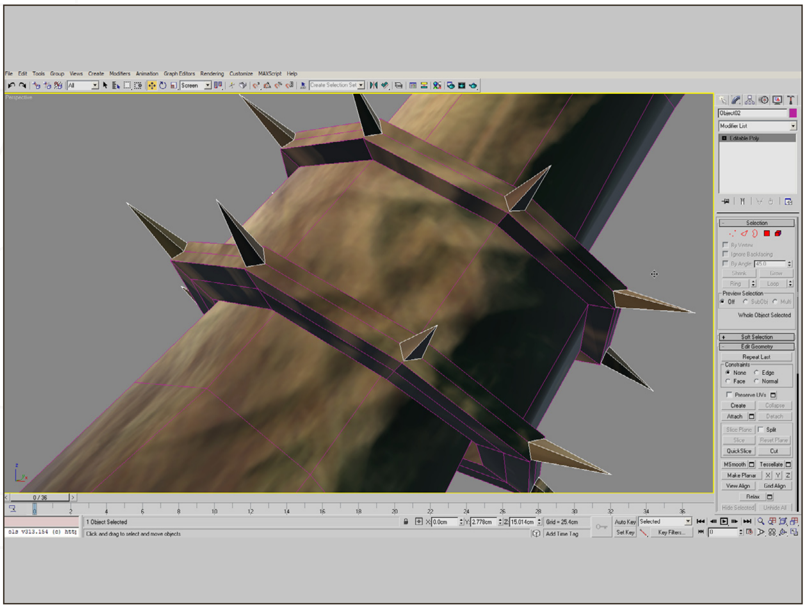


Fig 56

56. Chamfer these vertices and extrude the resulting polygons, collapsing them, as we did with the neck shackle spikes. We can then go ahead to detach these spikes as a new object (**Fig.56**).

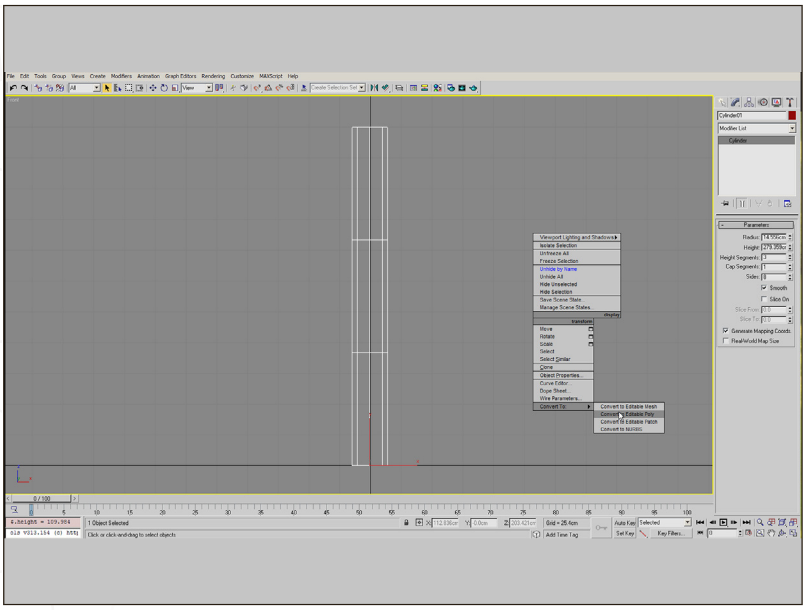


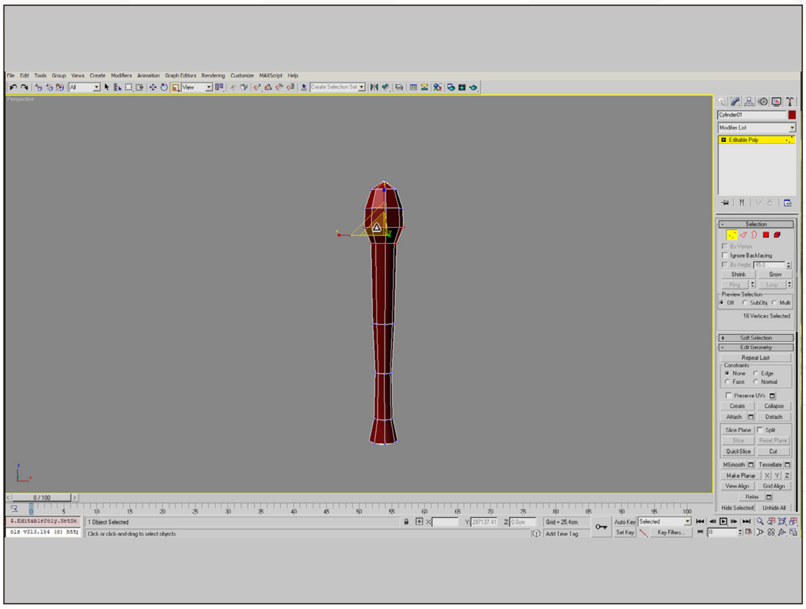
Fig 57

57. Clean up the geometry of the shackle now, by deleting the polygon on the raised sections and reforming them again using the bridge tool on the edge borders. After this is done, apply a Symmetry Modifier to the shackle and spikes. You can use this time to also duplicate the chain and hook from the back of the neck shackle, and place it on the back of the foot shackles; altering the shape and position of the chain links to sit on the floor and be more unique.

Let's create our characters weapon now. Still in Max, create a Cylinder with eight sides and three height segments. We don't want to create too much geometry just yet – we want to keep it manageable (**Fig.57**).

58. Alter the shape of the cylinder to the concept of our character's weapon. The object is probably made out of wood, so you can imagine a large branch of a tree, fallen to the ground. The shapes it could be are numerous, but for beating bad guys over the head and hitting home runs, there's one shape that seems to be popular throughout the ages. You may need to add more edge loops to keep a smooth silhouette (**Fig.58**).

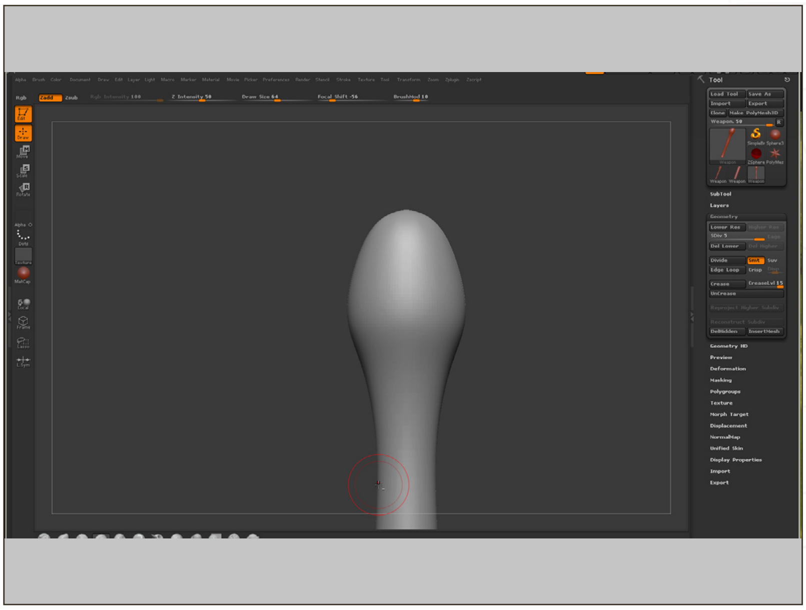
Fig 58



Into ZBrush

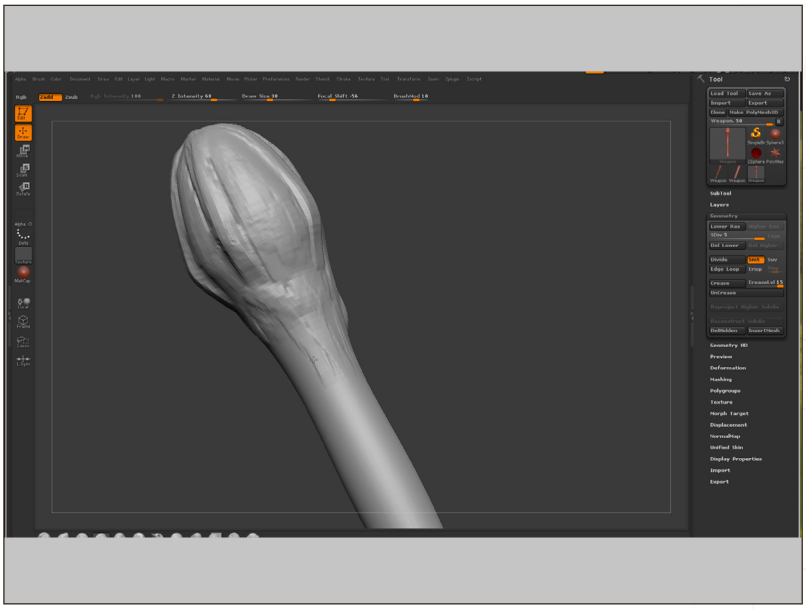
59. That should be almost all the modeling we need to do for our weapon. We should take it into ZBrush now and create a high poly version for the normal map. Export the object as an OBJ in the same way as we have done before, and import it into ZBrush (**Fig.59**).

Fig 59



60. Using the Clay tools brush, form the head of the club. You can imagine how with primitive tools made from rocks, slate and other items found lying around, carving anything beautiful from a big stick would be a challenge to say the least. At least our character has put in the effort! Give the head of the club rudimentary spikes (**Fig.60**).

Fig 60



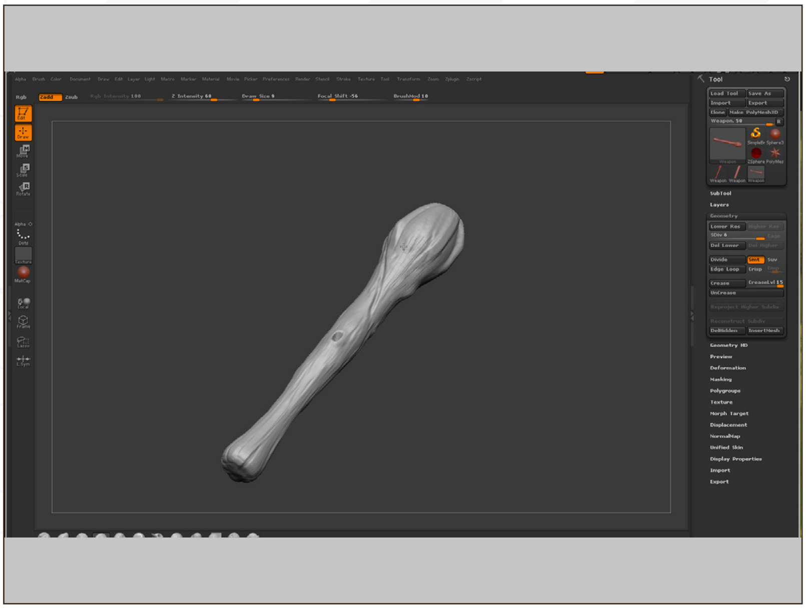


Fig 61

61. Carve into the body of the club now, hollowing out some areas and adding a large indent where it's perhaps gotten caught or scratched (**Fig.61**).

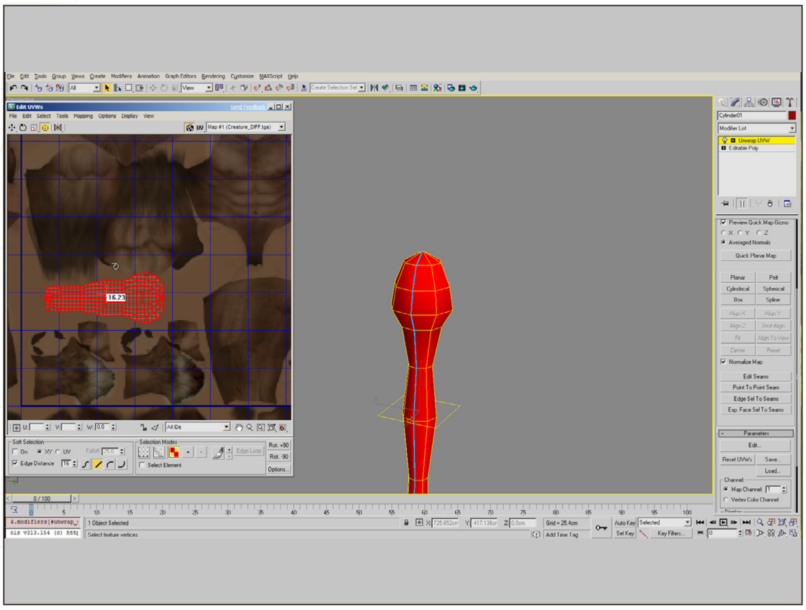


Fig 62a

...AND BACK INTO MAX

62. Back in 3ds Max now, I think it's a good time to unwrap our object. We could have done this before, but sometimes it's good to leave it until we know more modeling will most likely not be required. We can project over the detail already created in ZBrush and be back to the same stage shortly.

Using the knowledge you've learnt throughout this tutorial, use the Pelt mapping tools, alongside the Relax function of the UVW editor, to produce an efficient UV map for the club. Make sure it's an optimum shape for painting on, and it fits in the area of the full character map where we saved a place for it (**Fig.62a – 62b**).

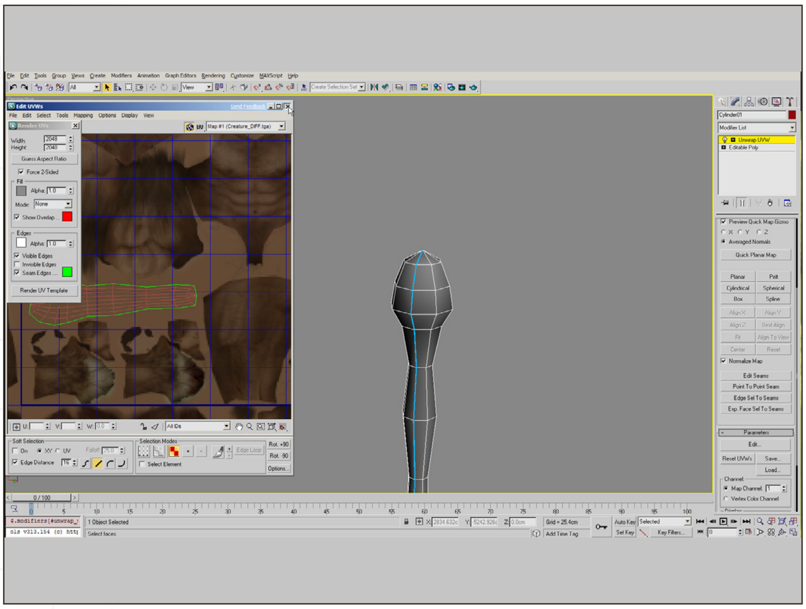
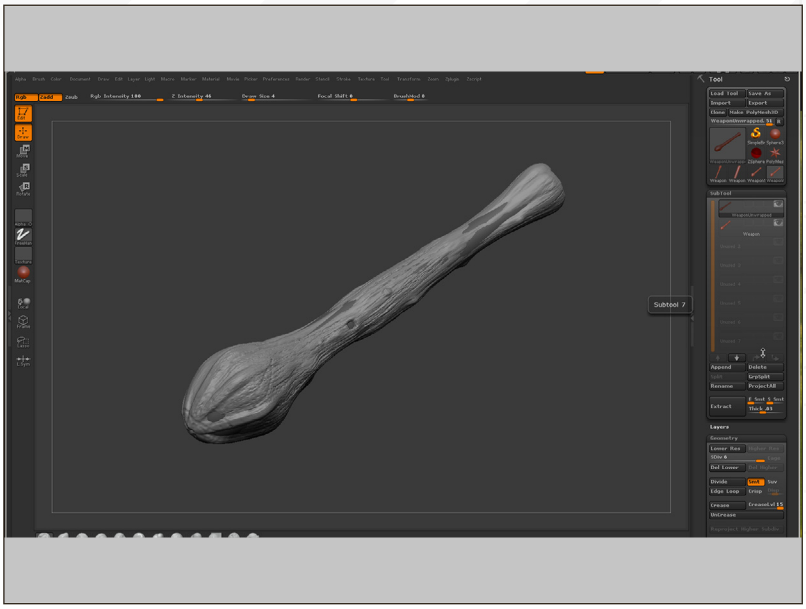


Fig 62b

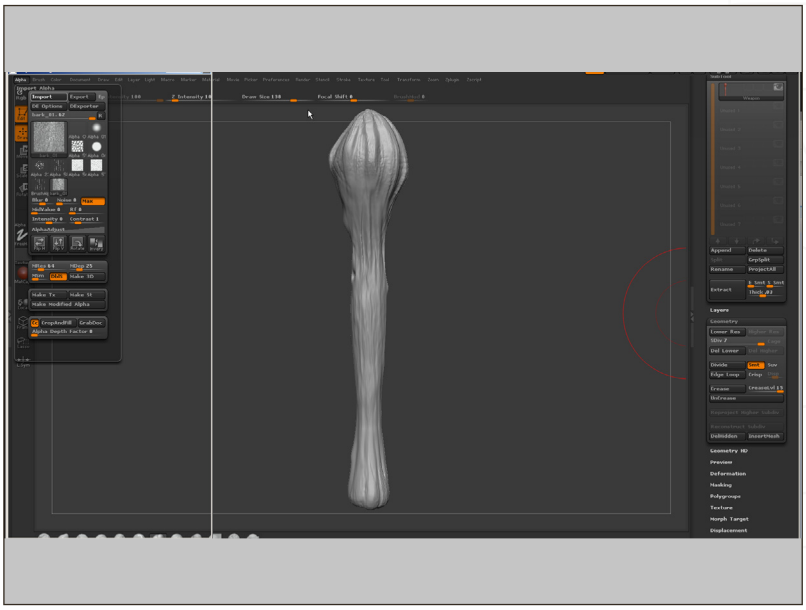
63. We should create a UV Template now, to add to our full character wireframe in Photoshop, aiding in the painting of the club texture. Using the same settings, render a UV Template now and save it off as a BMP. Close the UVW Editor, collapse our object, and export it as an OBJ (**Fig.63**).

Fig 63



64. Back in ZBrush, with our newly unwrapped model imported, divide it six times to match the resolution of our sculpt-in-progress, and append in our previous sculpt now as a SubTool. Check both models are at their highest resolution, and with the new model selected, hit Project All. Delete the old model and continue working on the model.

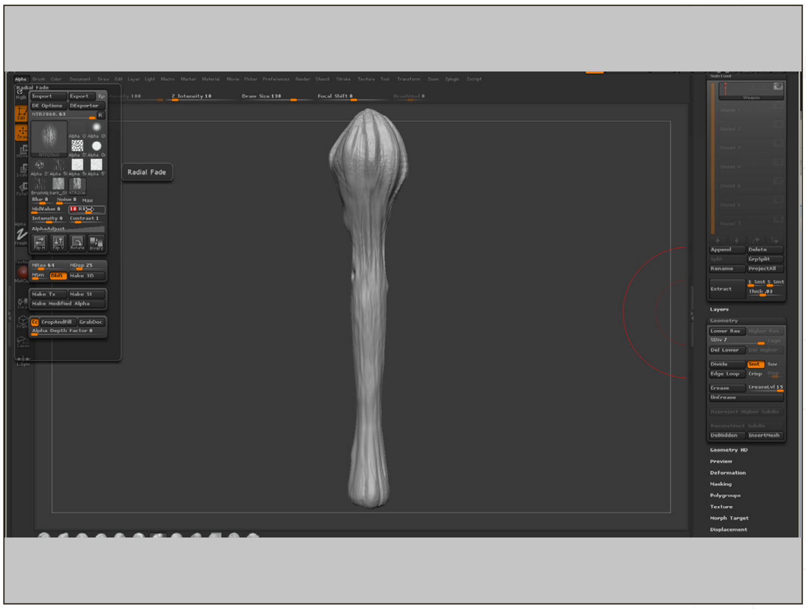
Fig 64



Alphas are very powerful in ZBrush for creating detail with brushes, but something we have yet to cover is stencils. Stencils are often overlooked, but are incredibly powerful tools in creating high resolution detail with a lot of control. Under the Alpha menu, select Import and choose a grayscale picture of some tree bark. Concrete, skin, mud and many other images can work brilliantly here, too (**Fig.64**).

65. Turn up the RF value, which stands for Radial Fade. This will fade out the edges of the alpha and won't give us a hard edge when we sculpt over it. You can also increase the Contrast of the alpha, as sometimes they can be quite dull and produce a noisy texture without any strong recessed or raised areas (**Fig.65**).

Fig 65



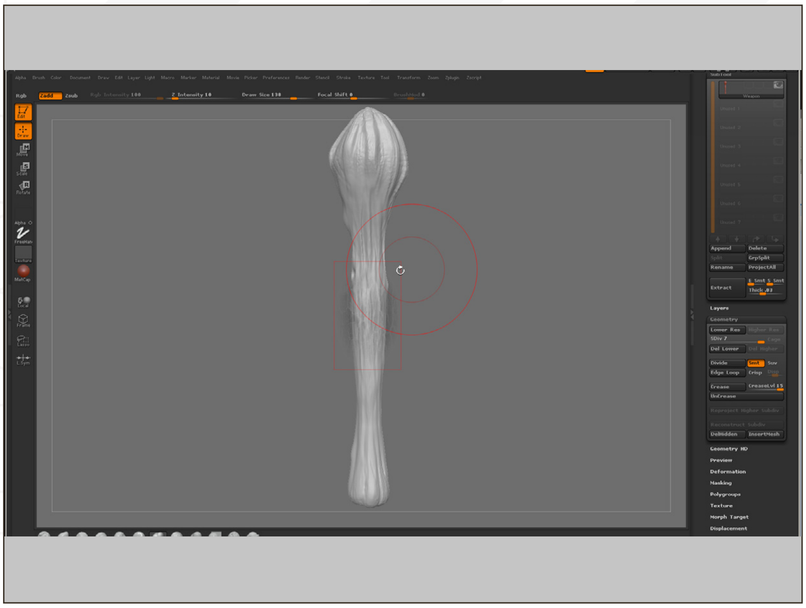


Fig 66

66. Once you are done changing settings in the Alpha menu, click on the button labeled “Make St.” (Make Stencil). This will switch the Stencil Mode on, using the chosen alpha (**Fig.66**).

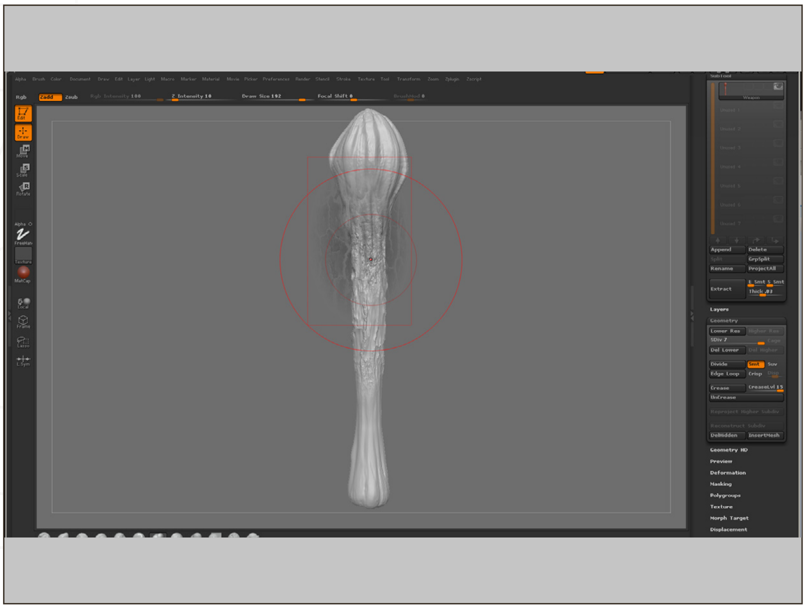


Fig 67

67. Hold down the spacebar key to access the stencil manipulation tools. You can use these to scale vertically or horizontally, rotate and transform your stencil.

The stencil basically acts as it sounds; it’s like a mask. White areas will not be affected by your brushes, whereas black areas will be fully affected. You may use any brush you wish whilst sculpting with the stencil. I find the Inflat brush, combined with smoothing, can produce the most realistic detail (**Fig.67**).

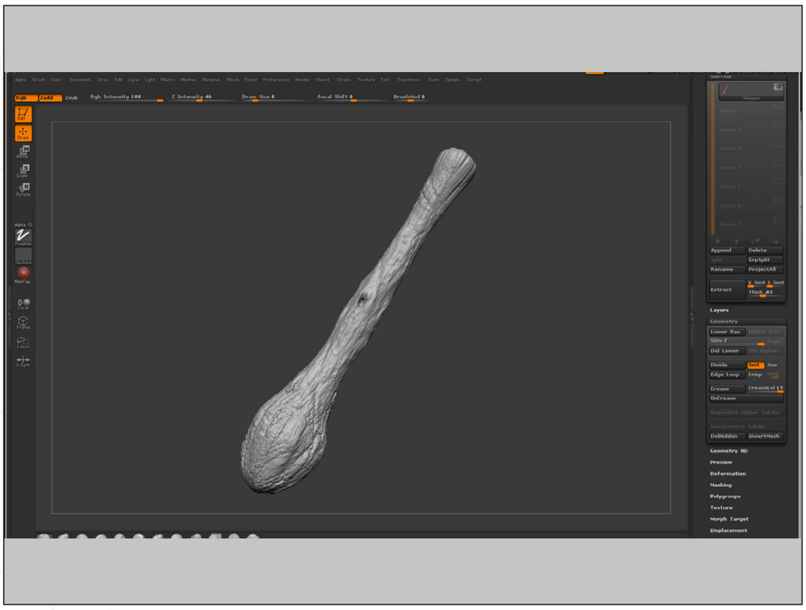
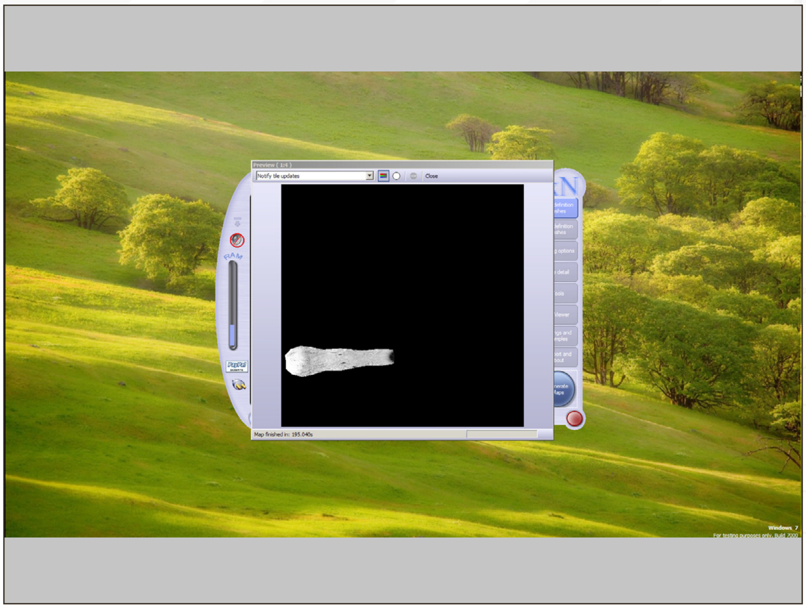


Fig 68

68. Go over your model now, sculpting in detail using traditional style methods and stenciling. Feel free to load in new alphas to try out with the stencils as you can get a huge range of effects this way (**Fig.68**).

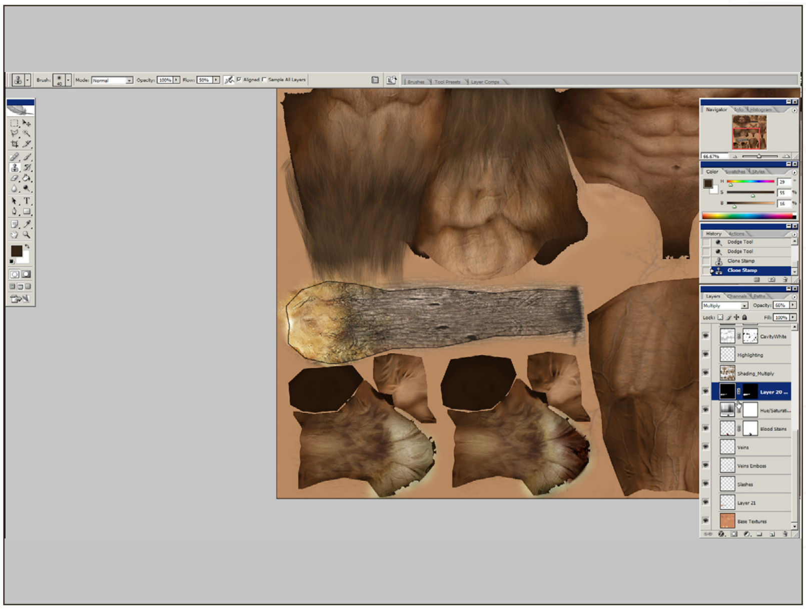
69. Now our weapon is complete, we can follow the same procedure as with our character to create a Normal map and an Ambient Occlusion map. Create those now (**Fig.69**).

Fig 69



70. I've gone ahead and dropped the Ambient Occlusion map into the diffuse texture, setting the layer mode to Multiply, just as we did with the shading layer. Using a combination of photographs and hand painting underneath it, build up a texture that resembles a fallen branch – the top and base worn and with no bark or covering (**Fig.70**).

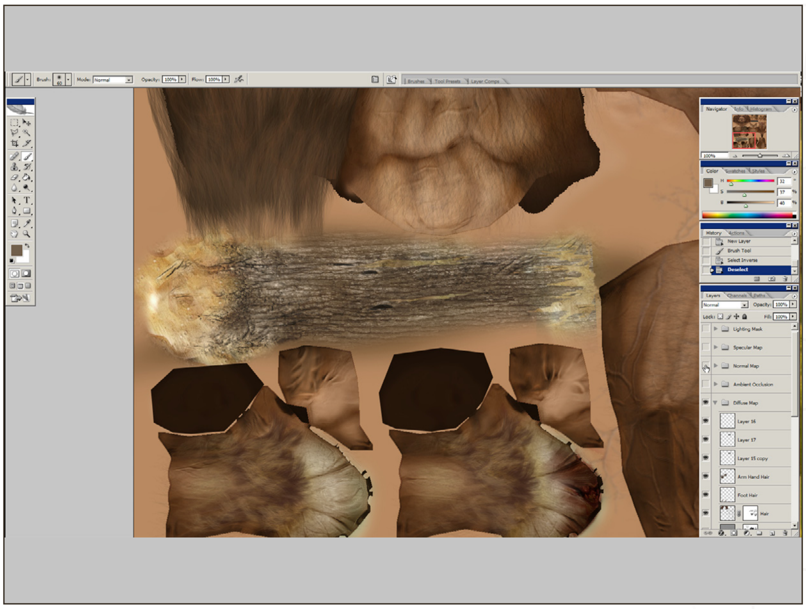
Fig 70



71. Place a layer underneath your photographs and load in a new photo of a lighter wood. You can also opt to hand paint using a wooden color. In the original photo layer, apply a layer mask. Paint carefully with a white brush over sections of bark to mask them out, showing the wood underneath. This is a good way to make it look like sections have been chipped or broken off, adding more interest to the texture.

Our character is now sporting a brand new weapon. Create a new shader for this to bring out the qualities of wood – you can also simply apply the character shader to it to view the normal map and diffuse shader setup immediately. Then make decisions from then on what needs to change to make it look more "wooden" (**Fig.71**).

Fig 71



72. Hair in videogames has always been notoriously hard, and unless a genius comes up with something revolutionary, it will stay that way for a while longer yet. There are a few ways to create hair in 3ds Max in real-time. Those being with a shader and with alpha-mapped planes or geometry; fur or hair shaders can be expensive in memory, and often end up simply looking fuzzy and blurry. The can be used to good effect

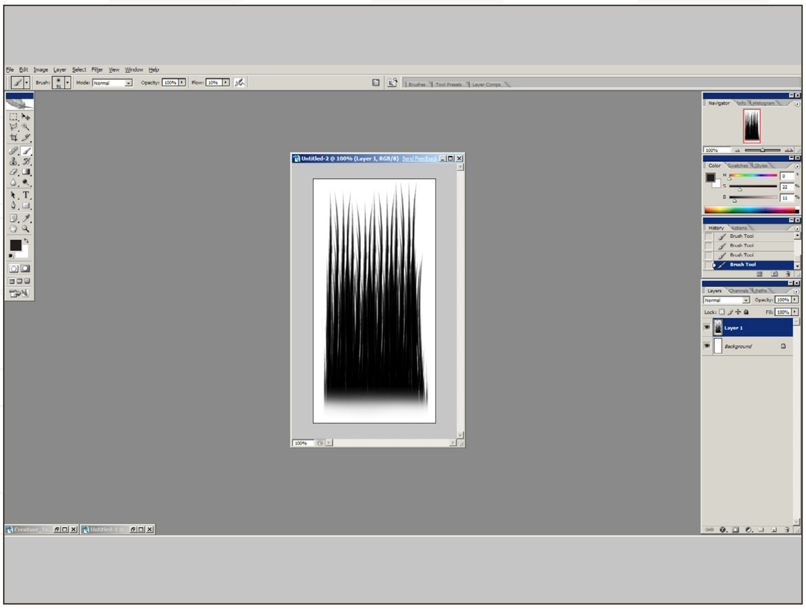


Fig 72

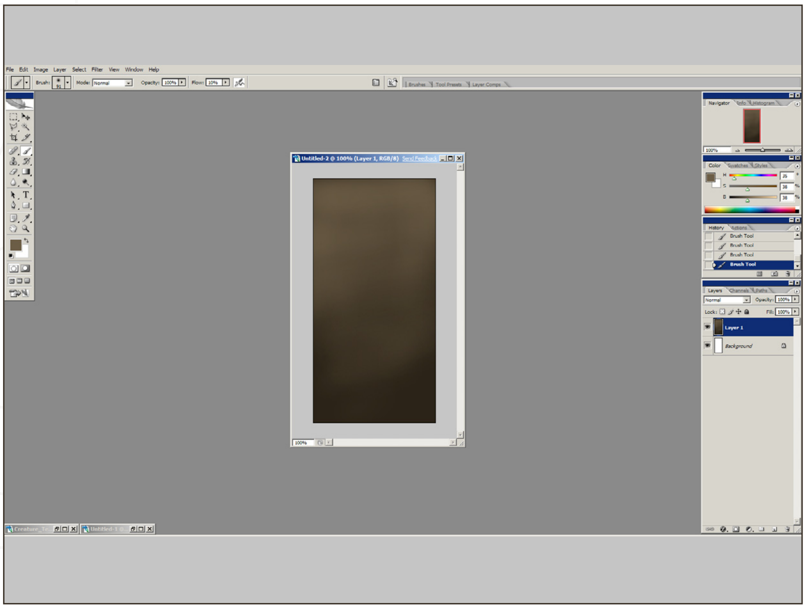


Fig 73

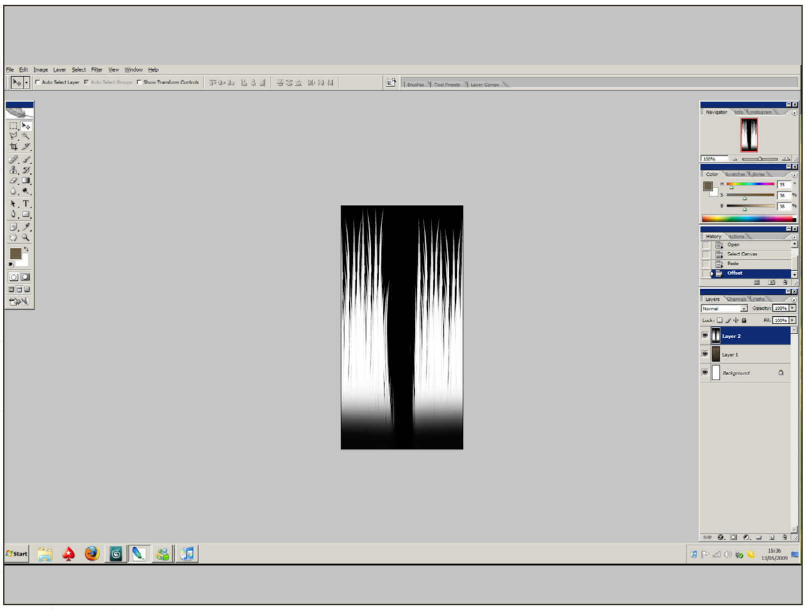


Fig 74

on models like teddy bears or furry animals, but when it comes to the hair of a human or a long haired animal, they fail miserably.

A better solution – although not a perfect one – is to use planes or tubes that are painted to look like hair. Using an alpha map, these objects can be transparent in certain areas, giving the impression of strands of hair.

Let's create a hair texture now in Photoshop. The hair texture needs to comprise of a diffuse map and an alpha map, which being grayscale we can put in the alpha channel of our diffuse texture to save loading two textures. Create a new document and make sure the background layer is pure white. A size of 512 pixels in height and 256 pixels in width allows us just enough room and resolution to create a good quality hair texture. We really don't need a square texture here as it would be a waste of space.

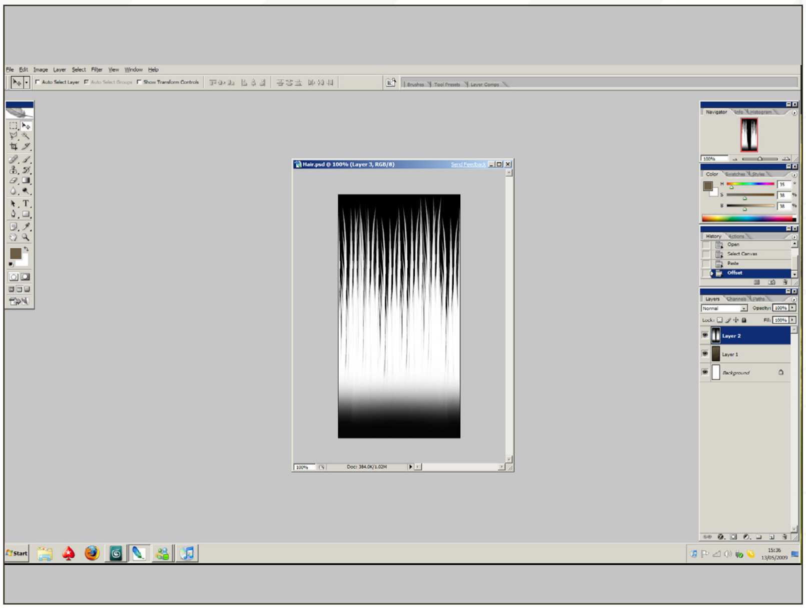
Create a new layer above this and, using our hair brushes we created in the last part, paint a lock of hair. Try to keep this quite vertical, with a little variation here and there. We will be tiling this horizontally, so it's important that there is not, for example, one hair that is significantly longer than the rest, so it does not stand out when tiled. Fade the bottom into the white background by erasing softly (**Fig.72**).

73. Now let's create the diffuse color. This one is really simple as we really just need to color information and a little noise. Paint two shades of brown onto a new layer. The top of the map will be the tips of the hair and the bottom being the roots (**Fig.73**).

74. Create a new layer and fill it white pure white. Above this, move our hair layer that we painted first. Merge these two layers together (Ctrl + E) and then invert the image (Ctrl + I). We want to tile this map horizontally, so make sure the layer is selected, then go to Filter > Other > Offset, and give a value of +128 in the horizontal and 0 in the vertical (**Fig.74**).

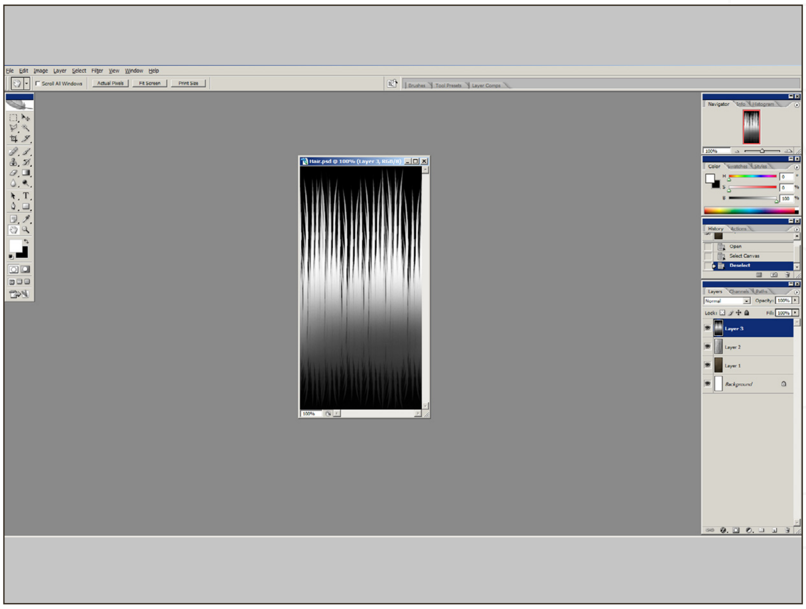
75. Using the Clone Stamp brush or the paintbrush, paint in the middle section to match the rest (**Fig.75**).

Fig 75



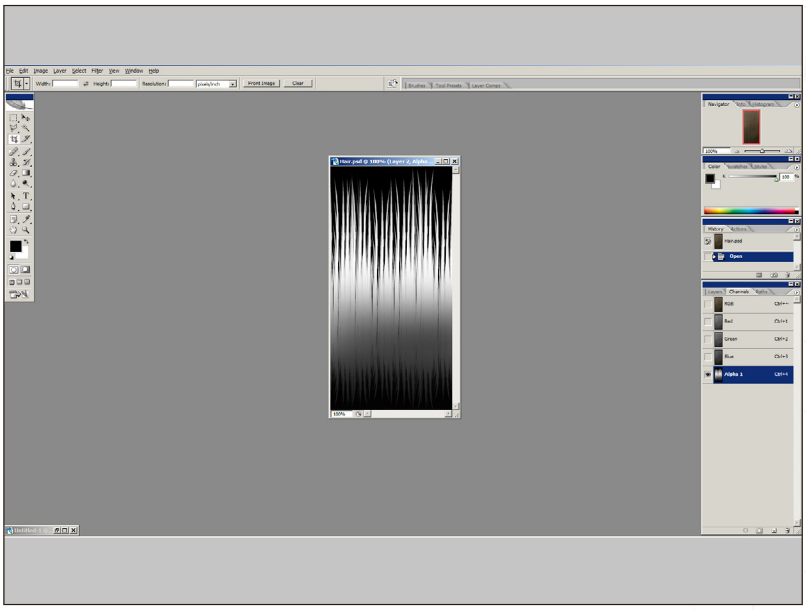
76. Now duplicate the layer, flip it vertically, and erase the upper half of it. You may want to scale it down a little, also. We want to try and fade the bottom half out but retain hairiness in the transition so it doesn't just look blurry. Darken the mid-section, but keep some areas pure white (**Fig.76**).

Fig 76



77. Hit Ctrl + A to select all, and then Ctrl + C to copy everything in this layer. Switch to your Channels palette and click on Alpha 1. At this point it will most likely be pure black. Hit Ctrl + V to paste your new texture into the alpha channel (**Fig.77**).

Fig 77



78. Now save off your texture as a TGA file, but on export make sure you select 32-bit rather than the other options, as we want to make sure it takes our alpha channel along with it. Open up 3ds Max and our character file.

Unfortunately ShaderFX does not display alpha channels all that well for us. The act of sorting which objects are behind and in front of others

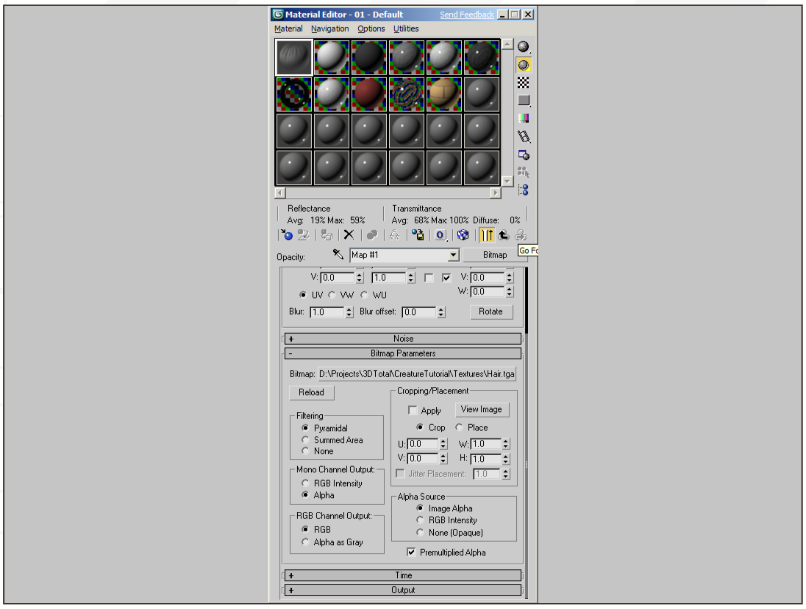


Fig 78

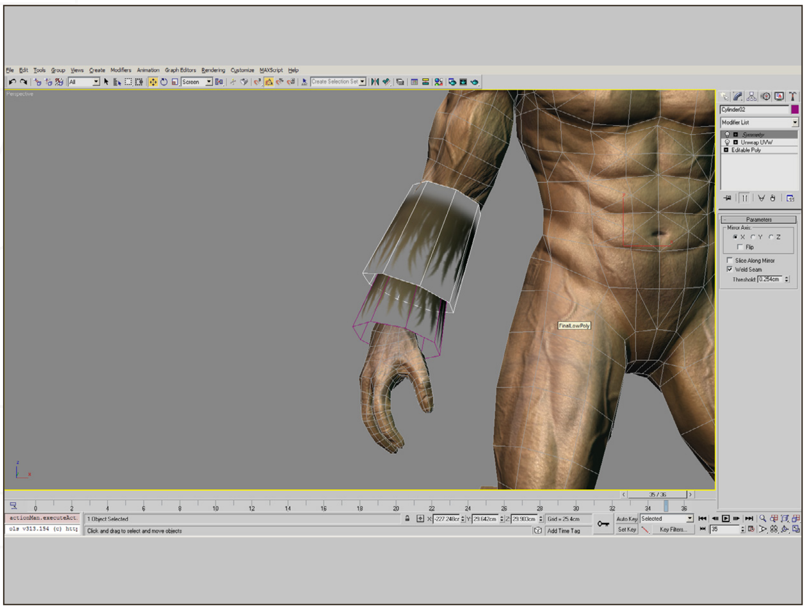


Fig 79

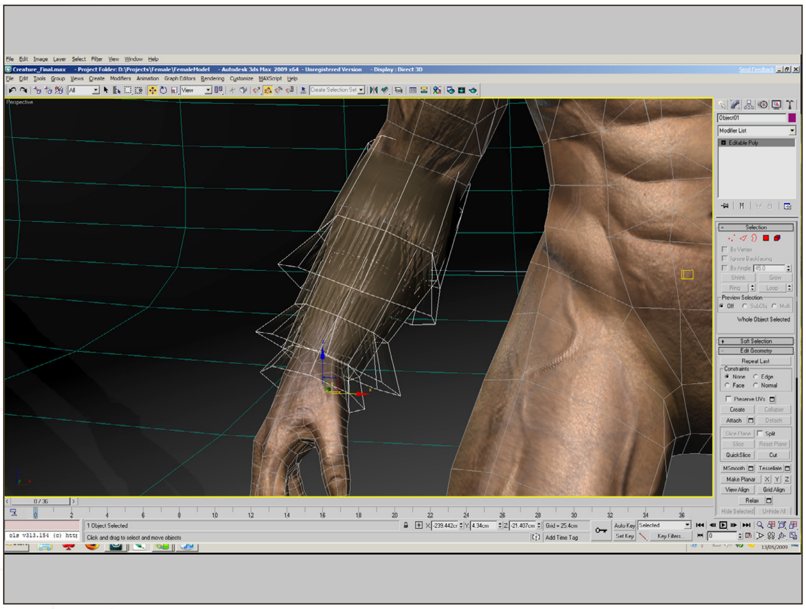


Fig 80

is called Alpha sorting, and is surprisingly quite a complex process. Max doesn't seem to do a very good job and there are many problems that arise when we want to view our alpha maps in the viewport. Most game engines have their own solutions for alpha sorting and the result will look quite substantially better in game.

Nevertheless, we have to work around this problem, and for now the best we can do is apply a standard Max shader to the hair objects we create. Set the diffuse and opacity maps to our Hair.TGA, and in the opacity map options make sure that Mono Channel Output is set to Alpha. This will use the alpha channel of our texture for the opacity slot.

Set the specular to something very low and save this material ready to apply to our hair objects as soon as we have created them (**Fig.78**).

79. Hide everything but our character by either selecting our character, right-clicking and choosing Hide Unselected, or selecting our character and pressing Alt + Q.

From the Create panel, select Cylinder and make a new one in the scene. Make sure it has around eight sides, or however many sided your characters arm is. Any more divisions will just be problematic. Convert it to an Editable Poly mesh and then delete the top and bottom polygons. Taper the cylinder so the lower end is larger than the other. We can duplicate this model also by shift-dragging it downwards and adjusting the vertices (**Fig.79**).

80. Add more edges to the model and conform it to fit the arm. You can adjust the lower ends of each cylinder to splay out from the arm, to give the silhouette and the shadow a hairy look. Duplicate the cylinder once more if necessary, and move it to cover the wrist. Sometimes this kind of covering up can be as much for design reasons as to hide seams or ugly deformations in animation. Our character has been well built and should not suffer from that (**Fig.80**).

81. Apply the same techniques to create hair around the legs (**Fig.81**).

82. We can apply the same techniques again to create hair on the head of our character. All of this extra hair we are adding just gives our character more interesting features. It breaks up the silhouette and uniformity of the skin, also (**Fig.82**).

Texture Adjustments

Once the character is fully modeled and textured, and the shaders are setup, we can make the final step of ensuring continuity between the concept art and the finished piece. I noticed the skin tones and hair are somewhat differing, and the version I've made looks too "human-like" for what should be a creature. It's best to take steps to remedy this now, by opening the skin textures in Photoshop and applying Hue/Saturation and Color Balance adjustment layers.

I shift the skin tone to a slightly yellower green, moving away from the pink flesh tone. Also mask the hair and tint it with a little more red and yellow to make sure it stands out from the skin. It would also be a good time to tweak the tone of the club, to separate it from the character in views where it's right over his body (**Fig.83**).

Sometimes when working on a project for a while it's easy to get caught up in details and it becomes very difficult to make large changes to your work. It takes courage and guts to shift the hue, increase the contrast dramatically, or change the characters face late in the project. I think this is because we become personally attached to our work, and the character itself. We are used to seeing it the way it is, and any changes really break that relationship. For that reason it's important to approach your work each time with fresh, critical eyes, looking for what's best for the asset or image.

In-Game

Our character may look complete, but this is a

Fig 81

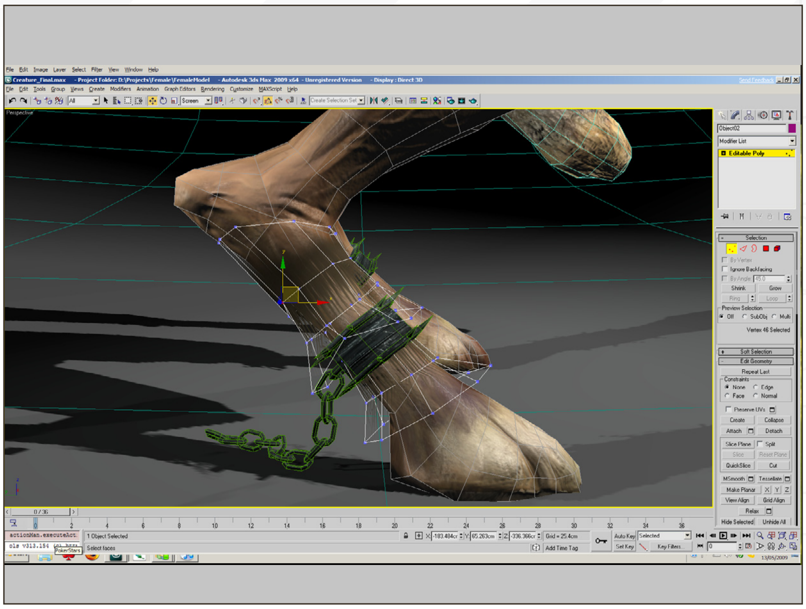


Fig 82

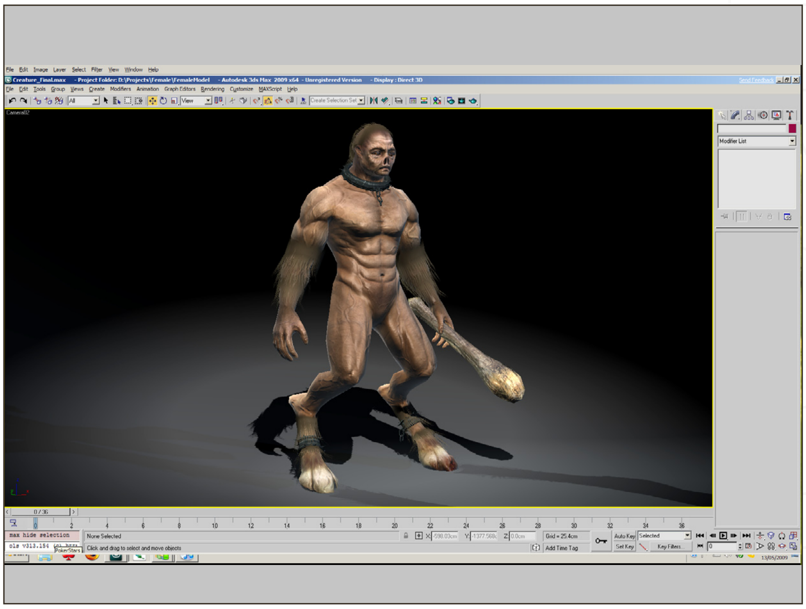


Fig 83

Fig 84

model designed for a game engine and will look even better when running around lit by multiple light sources, self shadowing, and with correct hair shading. It's important to remember that the way it looks in Max isn't always the way it will look in-game. If at all possible, try to get the character in-game early on, and keep testing all throughout the process to save time at the end. The difference between in-Max and in-game is illustrated in **Fig.84**. The image on the left is the Max viewport screenshot, and the image on the right is the same setup mocked up in the Crytek CryENGINE editor (used to create the PC game Crysis).

Autodesk are adding new features to the realtime display of objects in 3ds max, and with release 2010 they have added Screen Spaced Ambient Occlusion (SSAO), better quality shadow maps, camera shaders for depth of field effects and many more other additions. I can only see this improving in max as time goes on.New versions of other software packages will come out with constantly improved and more complex realtime features, competing for a marketplace that is soon to wake up to the host of new possibilites that realtime graphics offer.

Conclusion

Congratulations on creating your character up to this point. It's been a long process and we have learnt a whole lot along the way. The games industry is very wide ranging and you might be expected to do all of these steps when building a character, unlike the film industry where you might be responsible for only one or two of these many steps. Creating textures, shaders, modeling and sculpting are all integral parts of a real-time artist's job, and the more experience and knowledge you have of the entire character creation process goes hand in hand with the skills necessary to becoming a great artist. I hope this tutorial has given you a good starting ground for now going off and bringing your own characters to life!

Creature Concept by: Richard Tilbury

Tutorial by:

Joseph Harford

For more from this artist visit:

http://josephharford.com/

Or contact them:

Josephharford@googlemail.com

DOWNLOAD RESOURCES

- Free Low Poly Model & Textures

lightwave

NEXT GEN CHARACTER CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

Chapter 1 – Low Poly Modelling | Jul 09

Chapter 2 – High-Poly Modelling Part 1 | Aug 09

Chapter 3 – High-Poly Modelling Part 2 | Sep 09

Chapter 4 – Mapping / Unwrapping | Oct 09

Chapter 5 – Normal Mapping - Texturing | Nov 09

Chapter 6 – Material, Lighting & Rendering

The final installment in this series will discuss setting up a light rig, creating a shader for our character and show how to apply the numerous textures made in the previous chapter. The notion of body hair through the use of alpha maps will complete the character, before concluding with some additional accessories in the form of shackles, a chain and a wooden club.

DOWNLOAD RESOURCES

- Free Low Poly Model & Textures

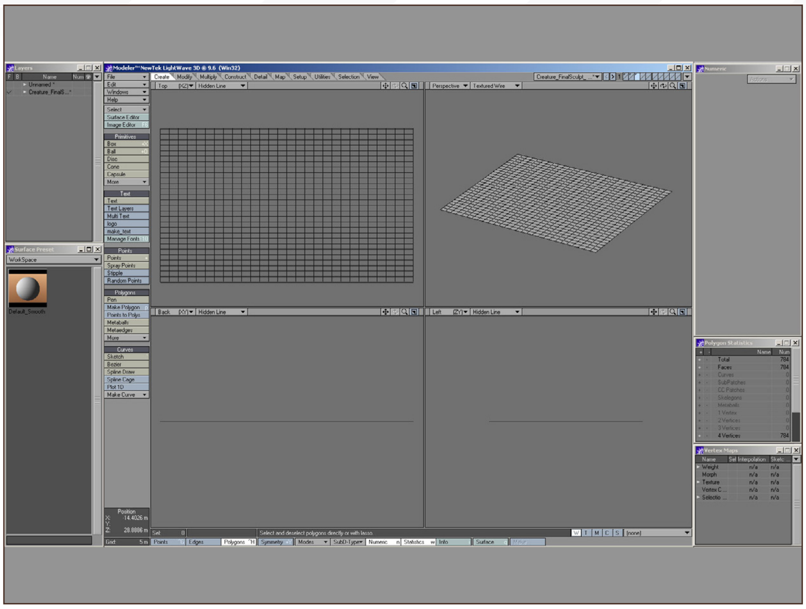
Chapter 6 – Materials, Lighting & Rendering

Software Used: ZBrush, LightWave, Photoshop

Hello and welcome to the final stage of the Next Gen Character Creation tutorial. In this chapter we are going to be looking at how to apply textures, set up nodal shaders, create a lighting rig and finally render out an image. While LightWave doesn't have a realtime Direct X shader like those found in Maya and Max, we're going to try to approximate this look using the standard render engine.

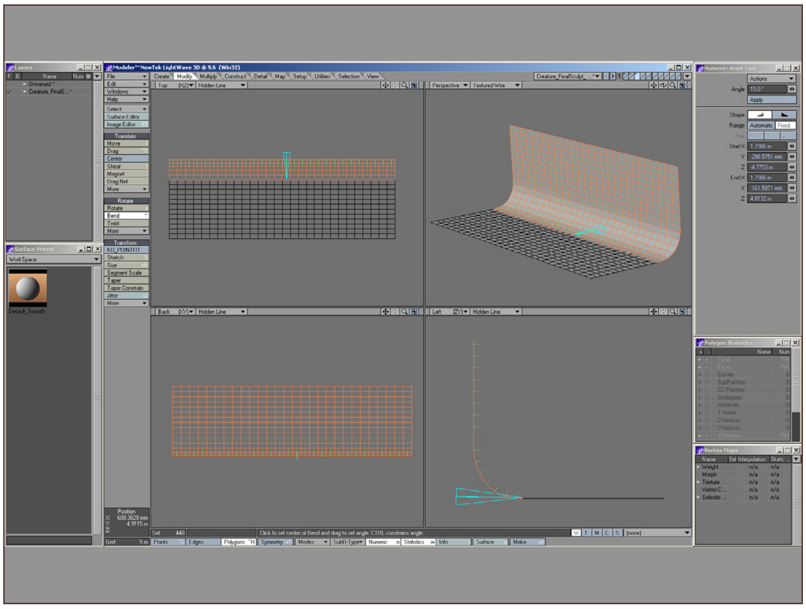
1. We're going to start off by creating a very simple studio model into which we can place our creature model. Load up modeller and create a rectangle with about 28 segments on the X and Y axes (**Fig.01**).

Fig 01



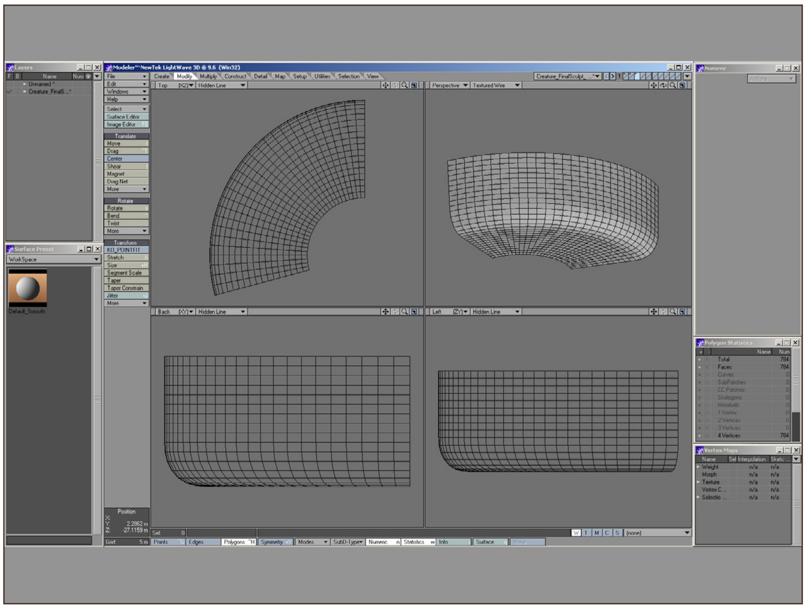
2. Now select about half of the polygons and use the bend tool to create a nice curve in the mesh (**Fig.02**). This will form the back wall of our studio environment.

Fig 02



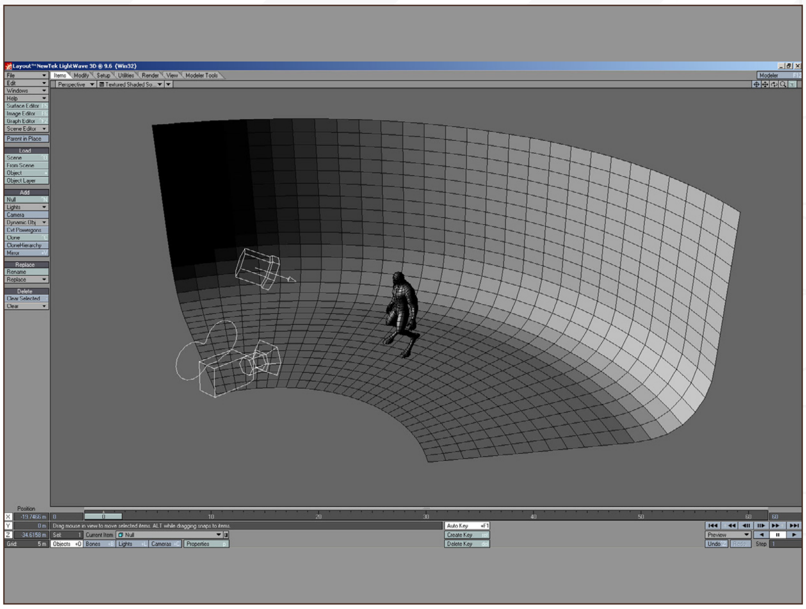
3. If you want to use the bend tool again on the Z axis you can create more of a curved environment (**Fig.03**). This is entirely up to you as it makes no difference other than it will be more flexible in terms of positioning the camera as there is less likelihood of seeing the edge of the wall. Name the surface "Studio" and save out the object.

Fig.03



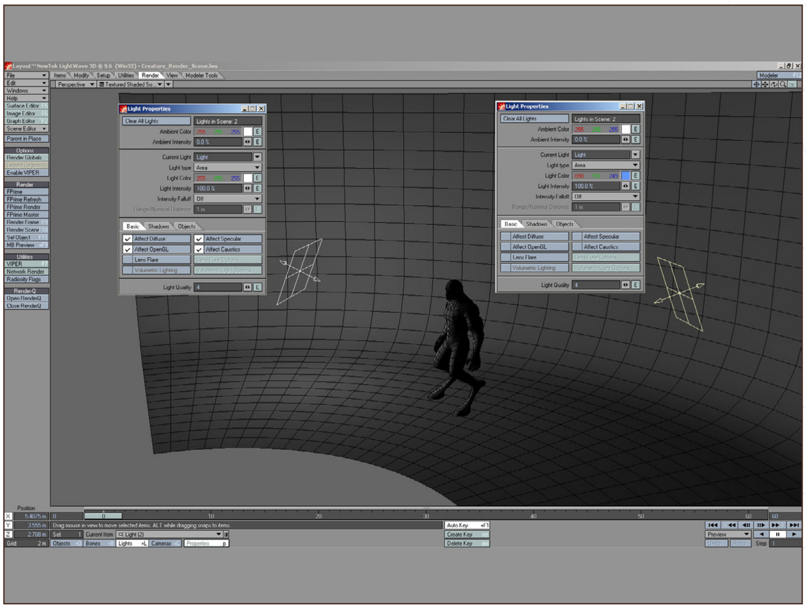
4. Let's fire up layout and load in our creature mesh and the new studio environment model (**Fig.04**). The first thing we need to do is turn on smoothing for the studio wall surface. Open the Surfaces Editor, select Studio and click the smoothing and double-sided tab at the bottom. Now we have a nice smooth environment.

Fig 04



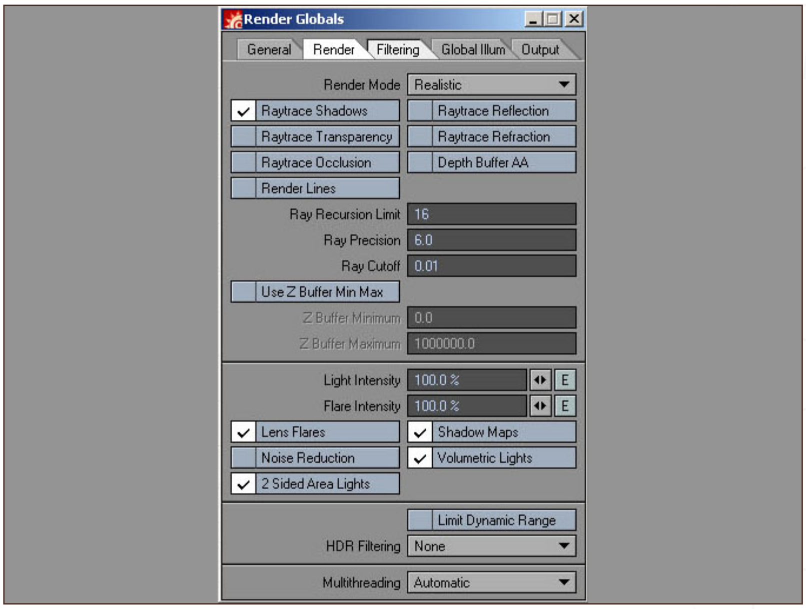
5. Next we need to set up a basic lighting rig. For this were going to use a very simple two light setup. Select the only light in the scene and press "P". Set the light type to Area, with an intensity of 100%, and position it as shown in **Fig.05**. Now clone this light, change the light colour to a light blue and position it just behind the character. See **Fig.05** for positioning and settings.

Fig 05



6. Now open the Render Globals window and select the Render Tab on the top. Click on raytraced shadows (**Fig.06**).

Fig.06



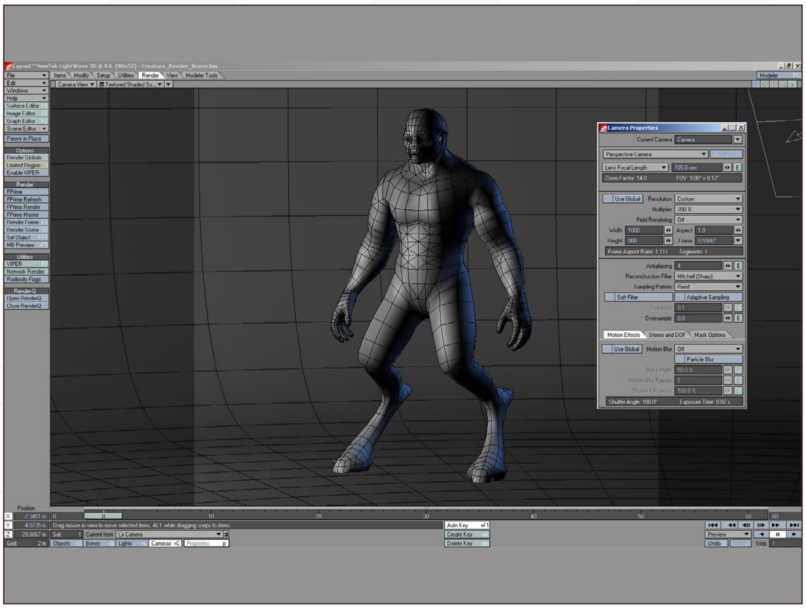


Fig 07

7. Now select the camera and open its properties panel (“P”) and change the focal length to 105.0mm. Set the width to 1000, the height to 900 and the anti aliasing to 4 – this should give us a nice sharp render. Now move it into a position similar to that shown in **Fig.07**

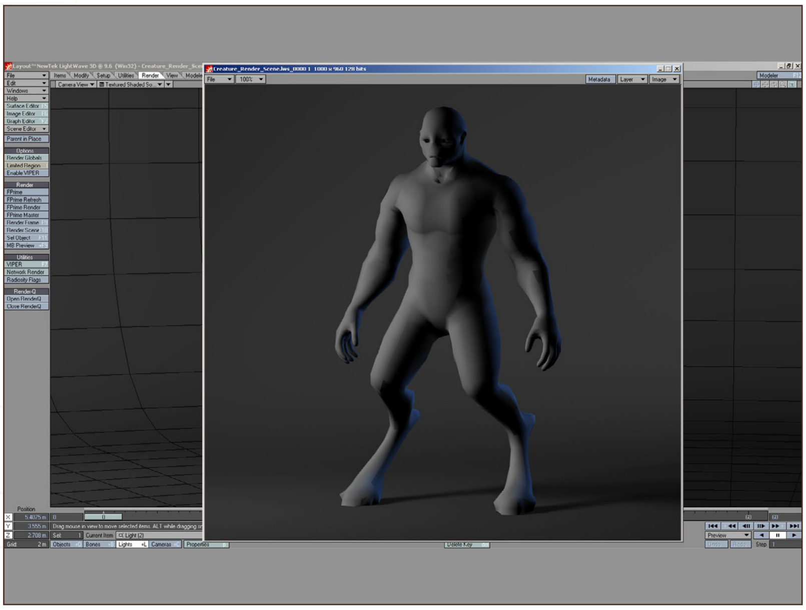


Fig 08

8. Ok, so let’s do a quick render to see what we’ve got. Hit F9 and you should get something like this (**Fig.08**).

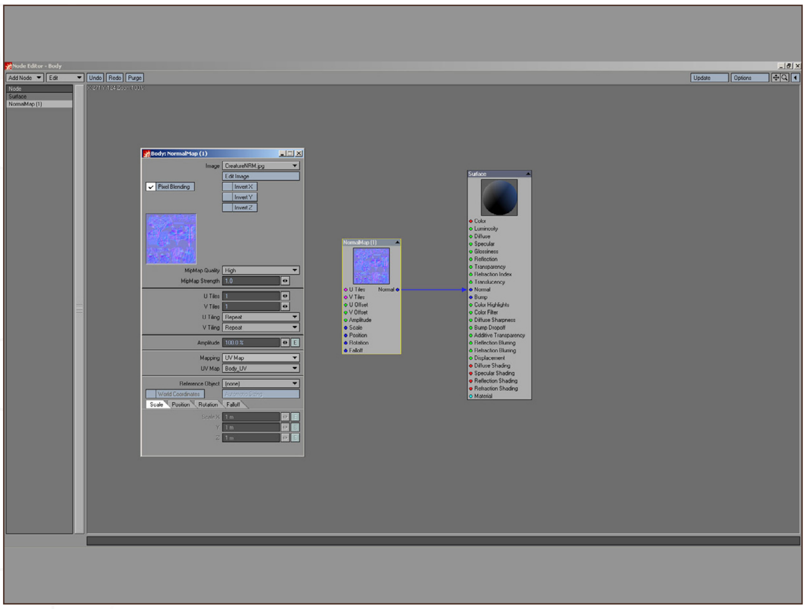
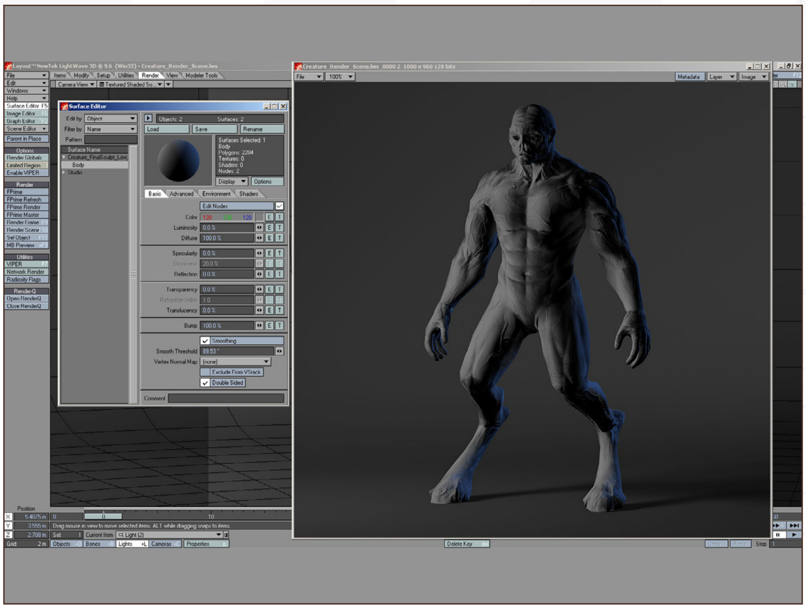


Fig 09

9. The next step is to apply the normal, Diffuse and specular maps that we created in the last chapter. Open the surface editor again and select the body surface. Click on the Edit Nodes tab at the top to bring up the node editor. Click Add Node, then select 2D Texture and Normal Map. Double click the normal map node that you have created and from the image drop down list, select Load Texture. Select the CreatureNRM.jpg that you created previously and click Load. Now set the mapping to UV map and from the drop down UV map box, select the Body_UV (**Fig.09**).

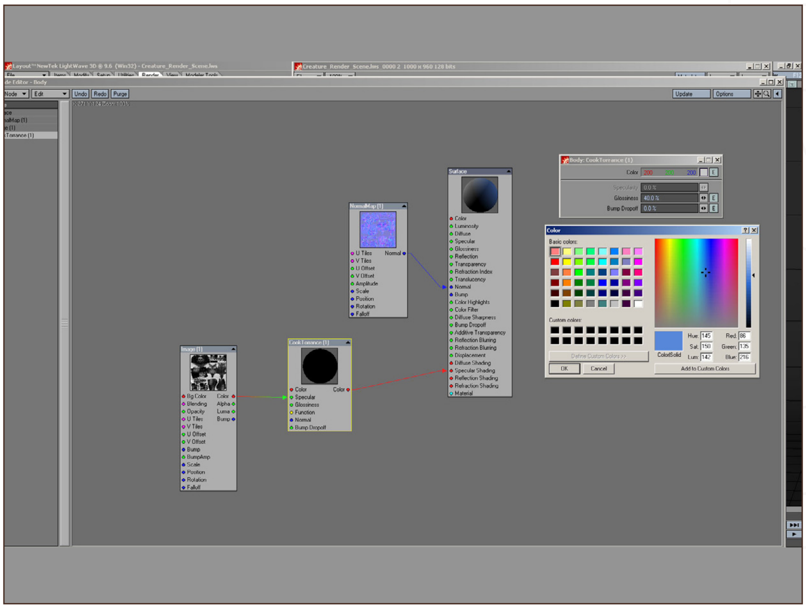
10. To apply the UV map to the shader simply drag a line from normal output of the node into the normal input of the shader box. Make sure that the tab next to the edit nodes in the surface editor main panel is select and hit F9 to do another render. You should get something like **Fig.10**.

Fig 10



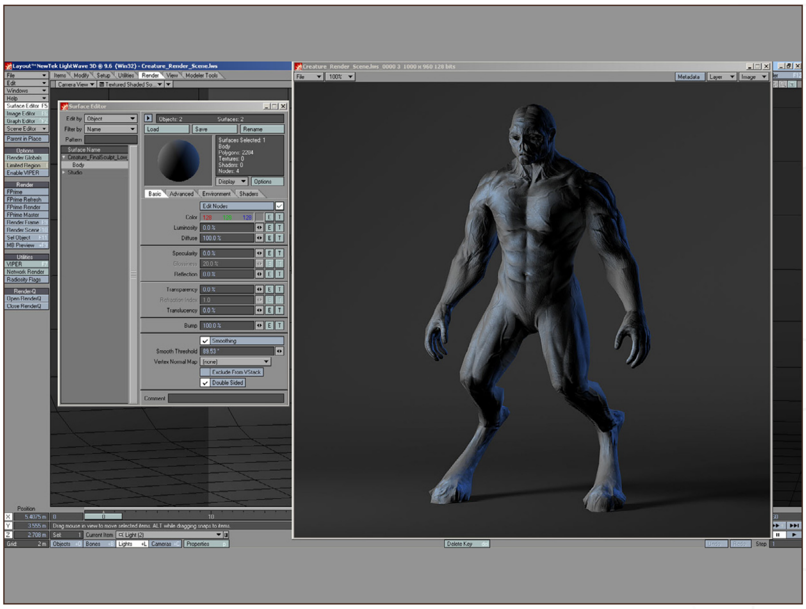
11. The next step is to apply the spec map using pretty much the same process as we did to apply the normal map. Open up the node editor again, but this time select Add Node > 2D Texture > Image. Double click the image node, select the CreatureSpec.jpg, select mapping type as UV again and then select the Body_UV. Now because most specular/reflections from human skin have a blue cast we need to use one of the Specular shader nodes. Select Add Node and go down to Shader > Specular > Cook Torrance. This gives us a nice diffused specular setting and also allows us to tint the colour. Plug the colour output of the 2D specular node into the specular input of the Cook Torrance shader and then plug the colour output of the Cook Torrance shader into the specular shading input on the main shader. Now double click the Cook Torrance node, open the colour selection box and select a light blue (**Fig.11**).

Fig 11



12. Let's do another render to check that everything has worked. Hit F9 again and you should get a render similar to that shown in **Fig.12**

Fig.12



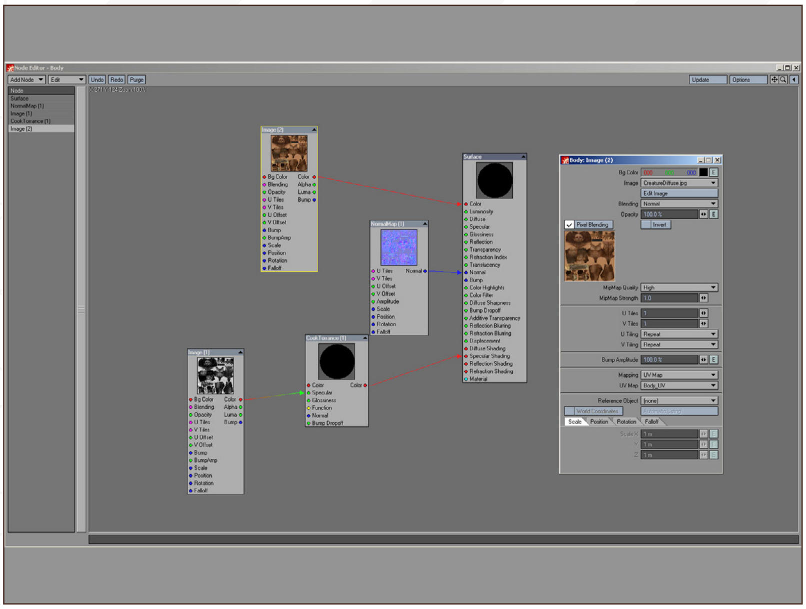


Fig 13

13. He's starting to take shape now so I think it's about time we applied the Diffuse colour map. Once again, open the Node Editor and select Add Node > 2D Texture > Image. Again, open the image node and load in the CreatureDiffuse.jpg, select UV mapping and the Body_UV. Now simply plug the colour out from the image node into the color input on the main shader (**Fig.13**).

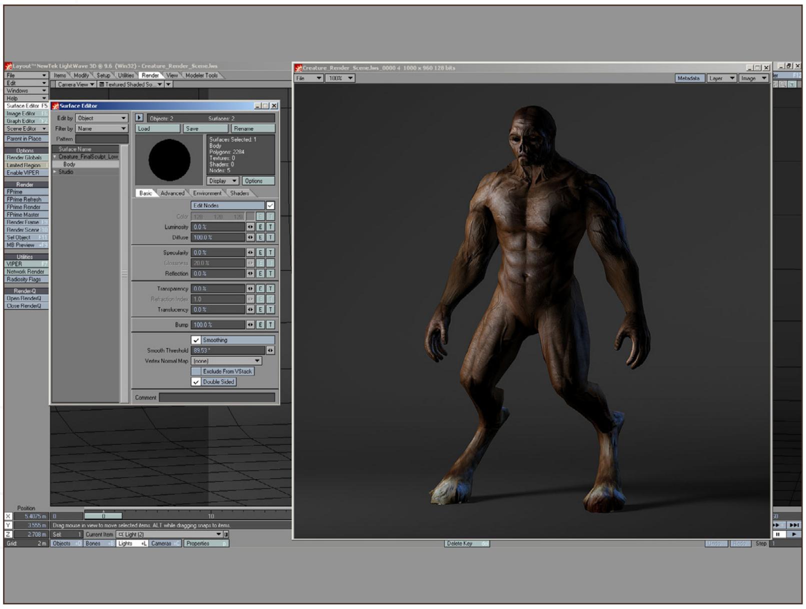


Fig 14

14. Once again hit F9 and check out the render (**Fig.14**).

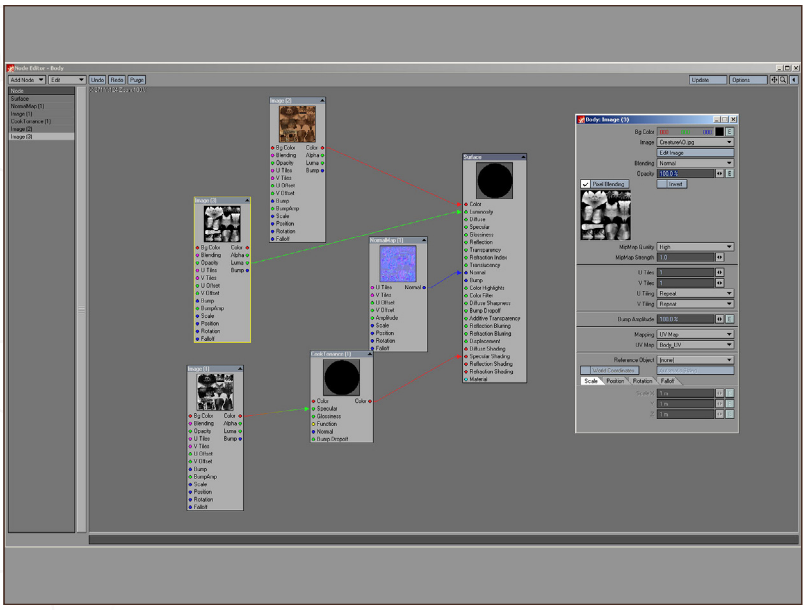
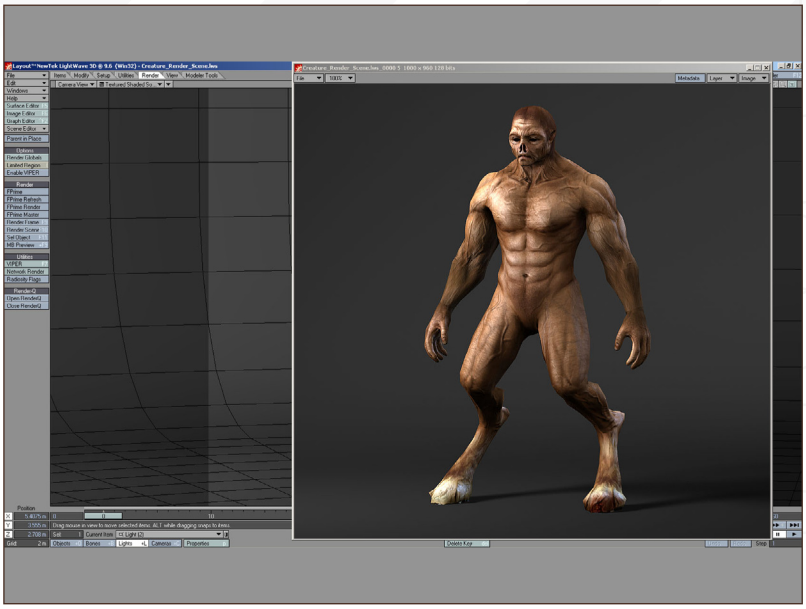


Fig 15

15. Because this is a game model we can't rely on complicated Global illumination effects to light our model. So instead we're going to use the ambient occlusion map that we generated using xNormal in the previous chapter to provide the global illumination. Applying this is a very simple process and I don't think I need to go through how to add a 2D image node all over again. But a quick little tip is to open the node editor and select one of the previously created nodes: let's use the Diffuse colour. Copy and paste it. Now all you need to do is change the CreatureDiffuse.jpg for the CreatureAO.jpg and plug the Luma out into the luminosity input on the main shader (**Fig.15**).

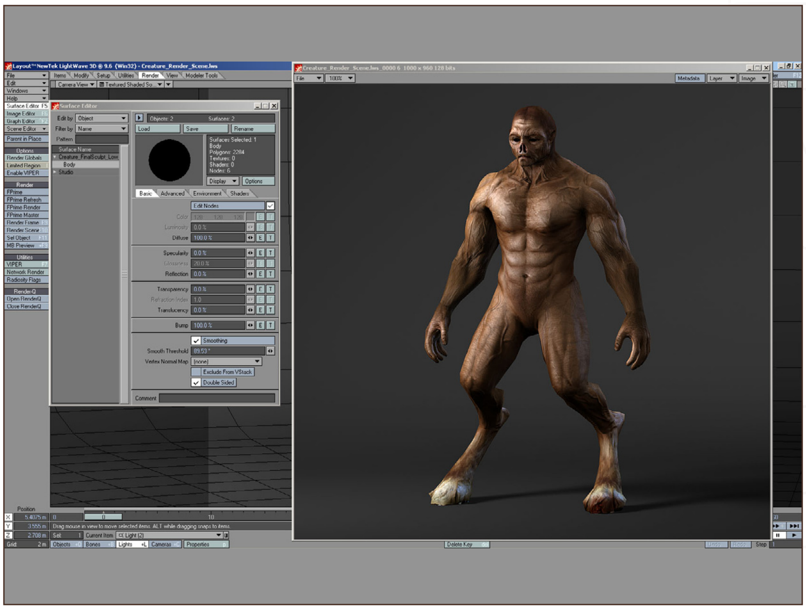
16. Press F9 again and you should see the effects of the Ambient Occlusion immediately (**Fig.16**).

Fig 16



17. As you can see he's looking a bit overexposed. A simple solution to this is to open the ambient occlusion image node and change the opacity of the map from 100% to about 60% (**Fig.17**).

Fig 17



18. Hit F9 again and you should have a much better looking render (**Fig.18**). Alternatively you could load the CreatureAO.jpg into Photoshop and lower the brightness using the adjust brightness/contrast.

So there we have the first stage of the rendering, lighting and texturing all set up and working. Now we need to look at adding the eyes, the polygon fur and a club.

Fig 18

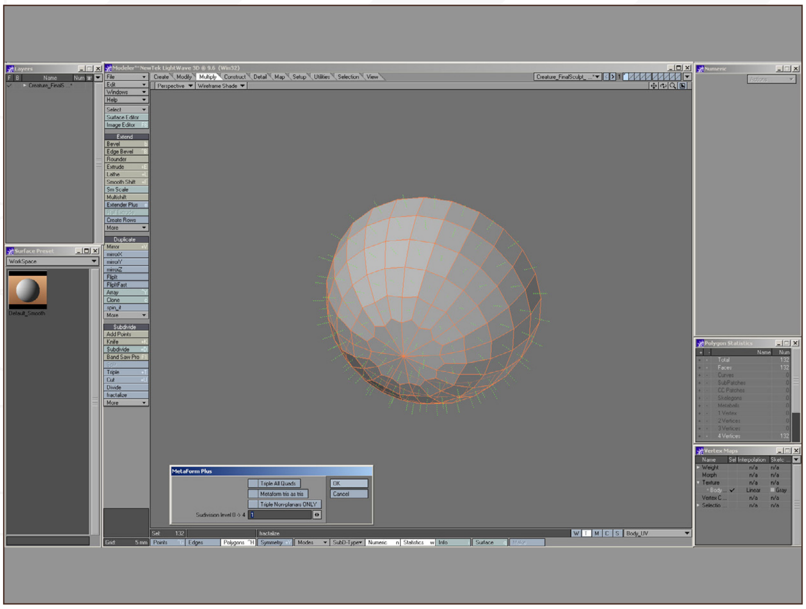


Fig 19

19. We'll start by texturing our eyes. One problem that we're going to have with the eye balls being as low poly as they are is that the reflections are never going to look right, so we're going to add a few more polygons to the front facing surface of the eye... Select the eye object and click the Multiply tab on the top row. Now select the "More" tab at the bottom of the list, on the left hand side. From the drop down menu select Metaform Plus and put in a sub division level of 1. This will effectively increase the number of polygons by three, but we can offset this by deleting the polygons at the back of the eye that will never be seen (**Fig.19**).

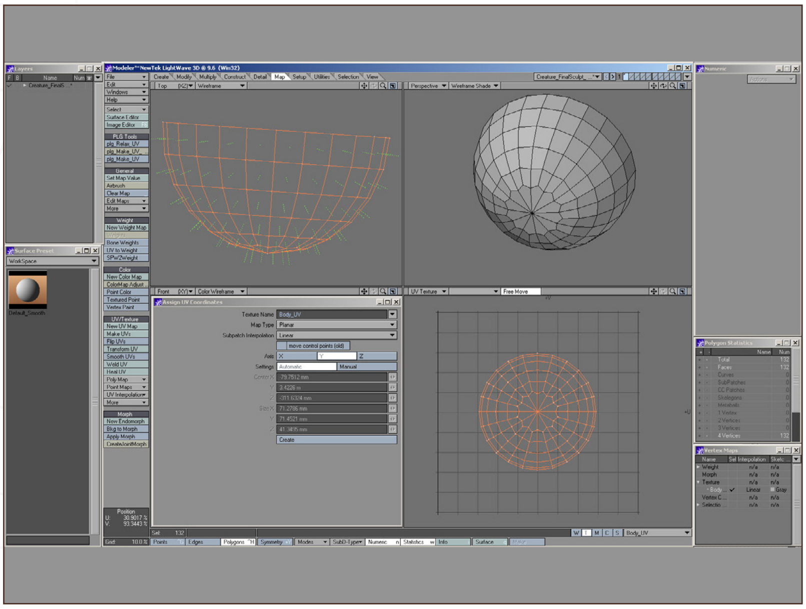


Fig 20

20. Now that we have our eye geometry, we need to texture it. Click the Maps tab and select New UV map. Select the Body_UV, set the Map Type to Planar and the axis to Z. Hit enter and you should get something like **Fig.20**.

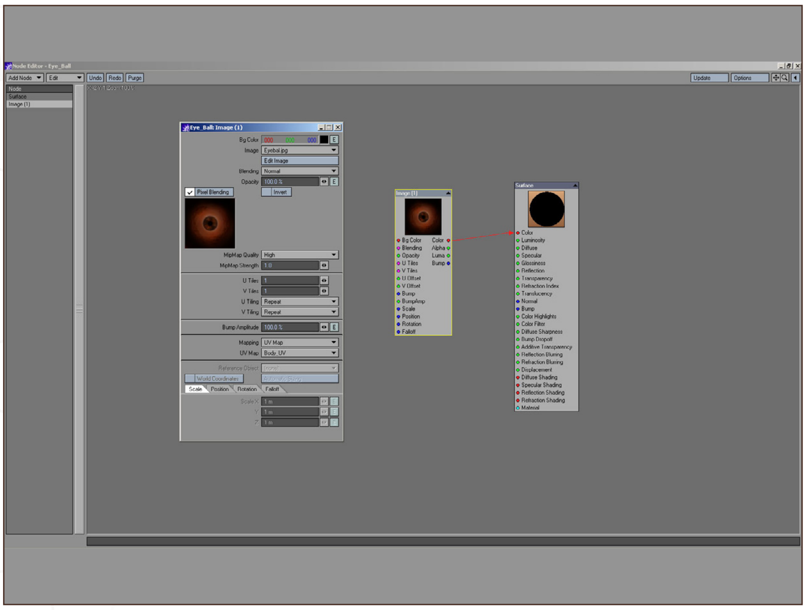
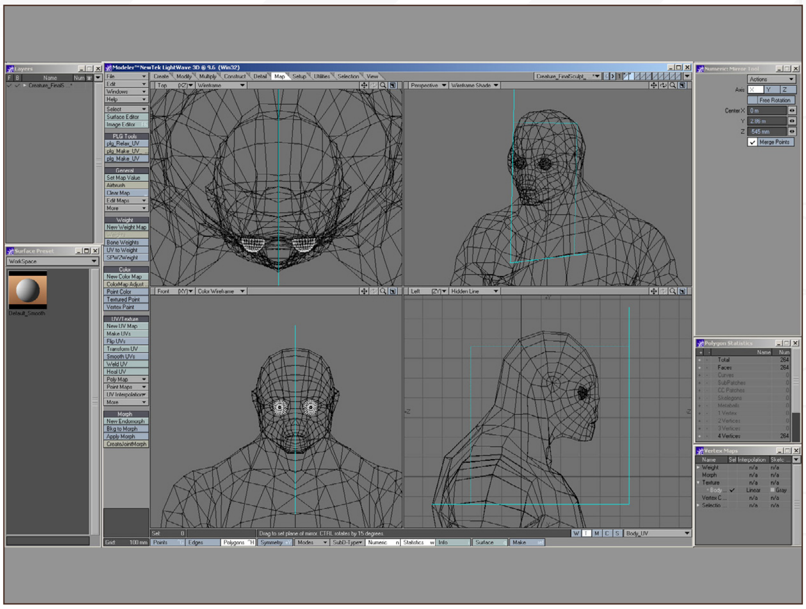


Fig 21

21. Give the geometry a surface name ("Q") – I called it "Eye_Ball". Now open up the Node Editor, add a 2D image node and load in the eyeball.jpg texture. Select the Body_UV map and plug the colour out into the colour in the shader (**Fig.21**).

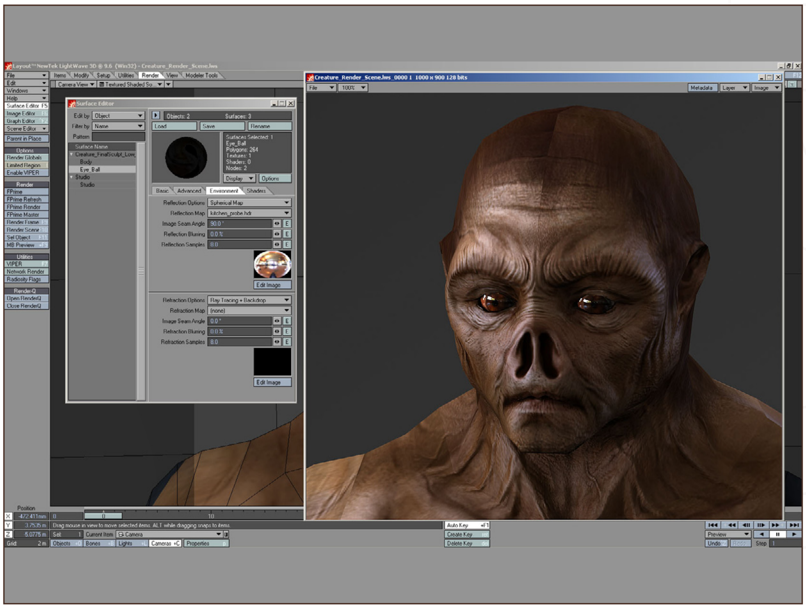
22. Now that we have one eye we're going to need to mirror it so that we can have an eye on the other side. Simply select the geometry, use the Mirror tool ("Shift + V") and set the numeric values for the X axis to 0 (**Fig.22**).

Fig 22



23. Ok, so that's the eyes set up and textured. Now we need to look at shading them. Let's switch back to the scene we created earlier in Layout. Open the Surface Editor and click on the Eye_Ball surface. Set the reflectivity to 3% and click on the Environment tab. Now in the Reflection options drop down select Spherical Map and in the Reflection Map box load in Paul Debevecs Kitchen probe HDR. You can download it from here: http://www.debevec.org/probes/ . You can experiment with different probes from his site; I found this one gave the best results. Now do an F9 render and you should have something like this (**Fig.23**).

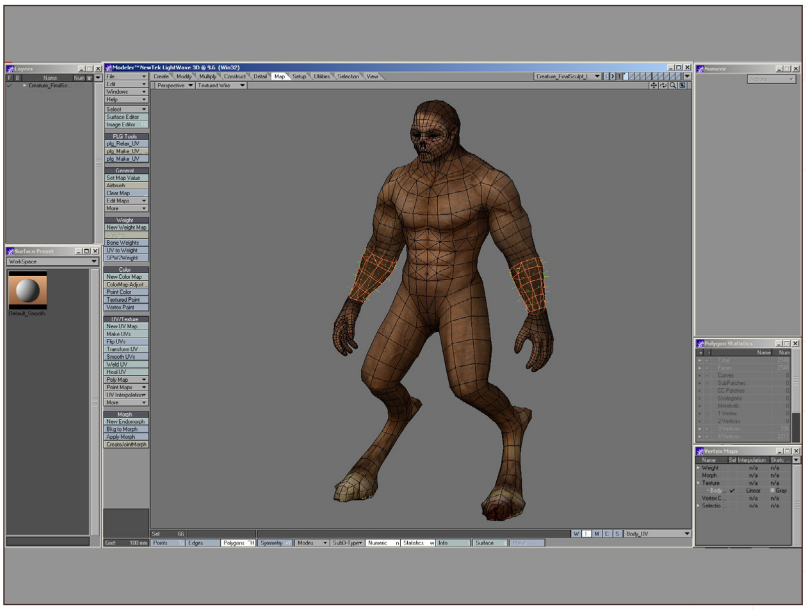
Fig 23



So the eyes are done... now it's time to move on to the fur. Obviously with this being a game model we can't use any clever fur shaders such as Sasquach or Fiber Factory, so we're going to have to make everything out of polygons and hope for the best.

24. We'll start by cutting out the two sections of the arms where we want to create the fur (**Fig.24**). Copy and paste these into a new layer.

Fig 24



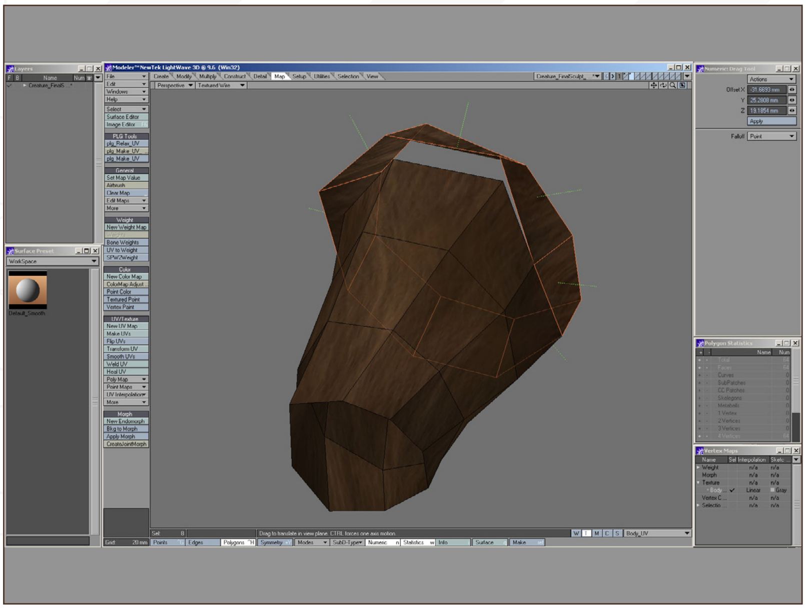


Fig 25

25. Now select the first loop of polygons and cut and paste them so that they are no longer connected to the adjoining polys. Using the Numeric Drag tool, start pulling the points out along the bottom edge. This will give us a nice 3D look when we apply the full alpha maps later on (**Fig.25**).

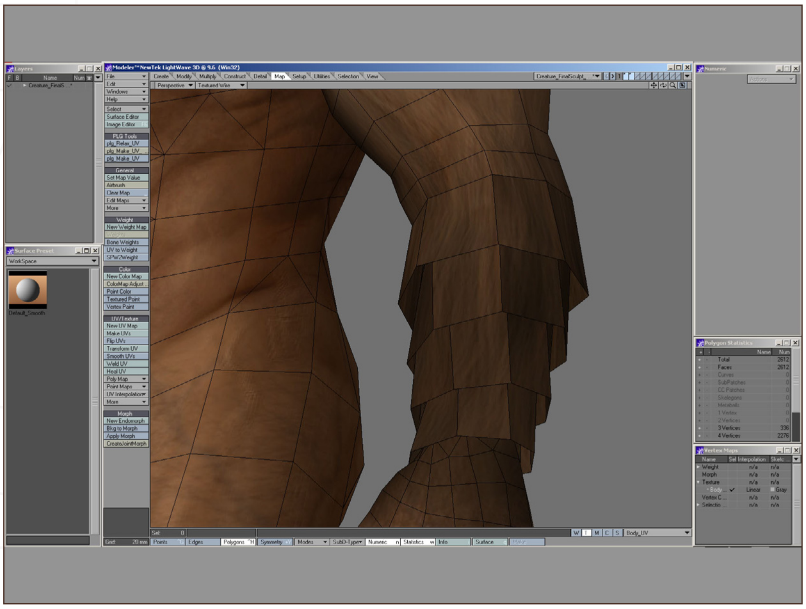


Fig 26

26. Now do the same for each loop of polygons below this one. You should end up with a nice layered group of polys that will go on to make the fur (**Fig.26**).

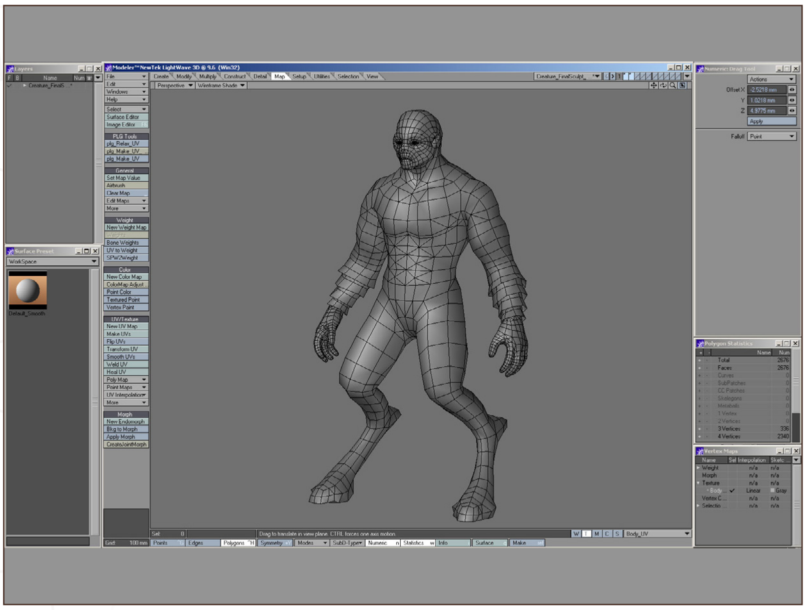
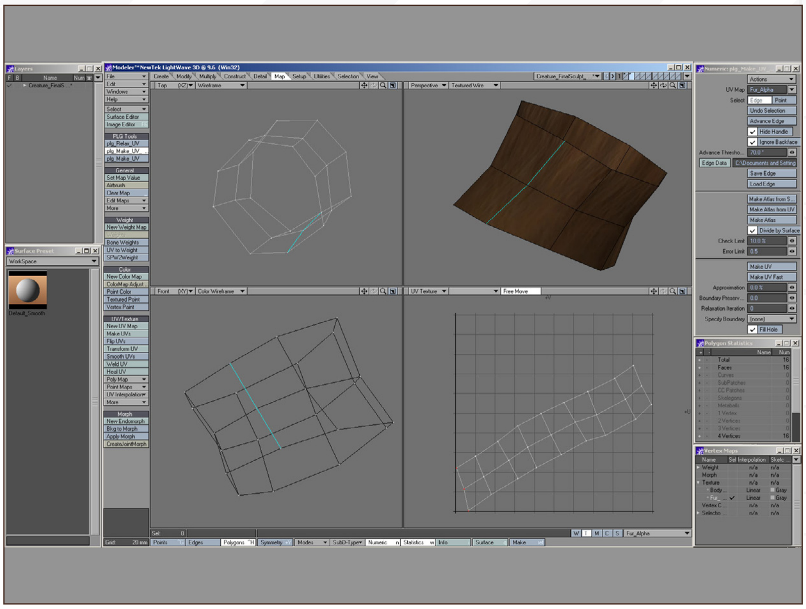


Fig 27

27. Do exactly the same for the other arm. You can see in **Fig.27** that I have used the Bandsaw tool once on each loop just to give it a little bit more detail.

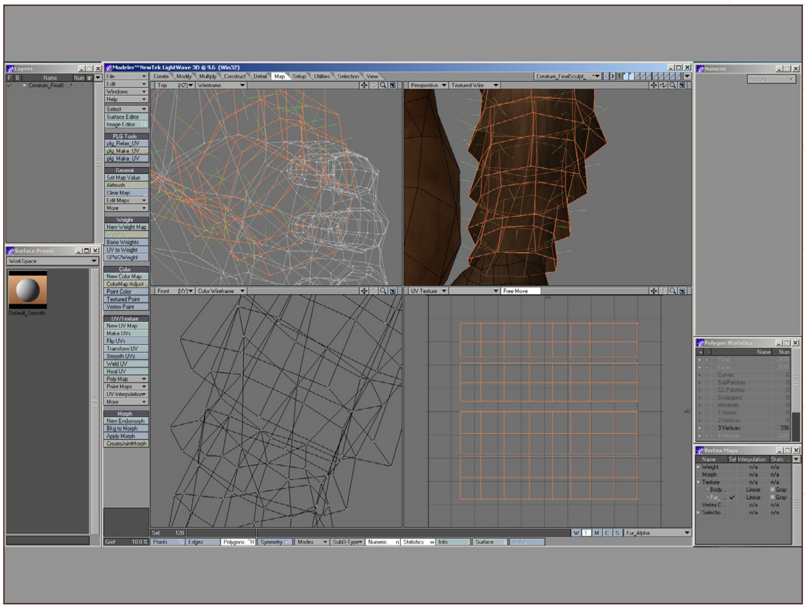
28. We need to unwrap each hair loop now using the PLG tools that we used previously to unwrap the character base mesh. Select each loop and create an edge down the back, as shown in **Fig.28**. Now simply unwrap each piece into a new UV map called "Fur_Alpha".

Fig 28



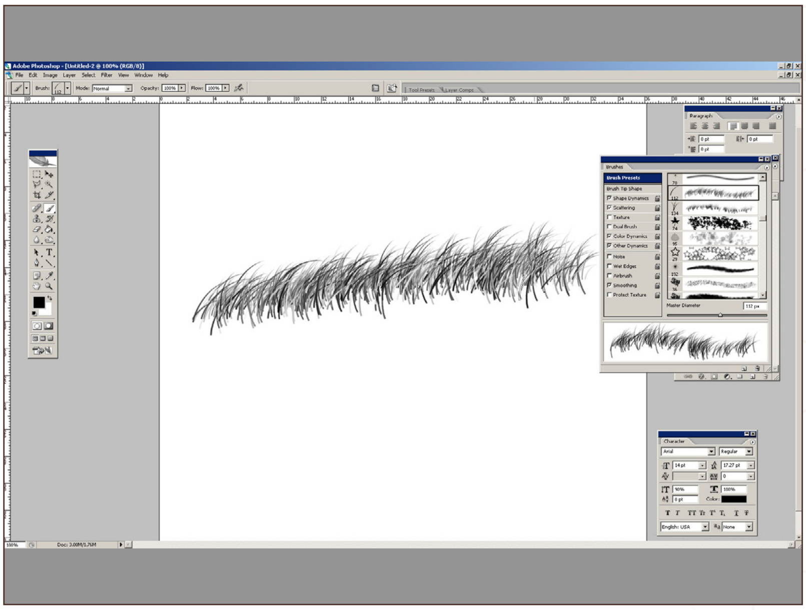
29. As you can see from **Fig.28** the unwrapping process creates a very curved, untidy UV. In order to make it easier to create the textures in Photoshop, I've straightened them all out by selecting each row of verts and using the Stretch tool and the Action Center set to Selection. By doing this I can simply contract the selection and the verts will all align in the middle. You could also do this by hand by just dragging the verts around with Snap turned on (**Fig.29**).

Fig 29



30. We're going to paint the fur in Photoshop by using the default Eyelash/Fur brush shown here in **Fig.30**.

Fig 30



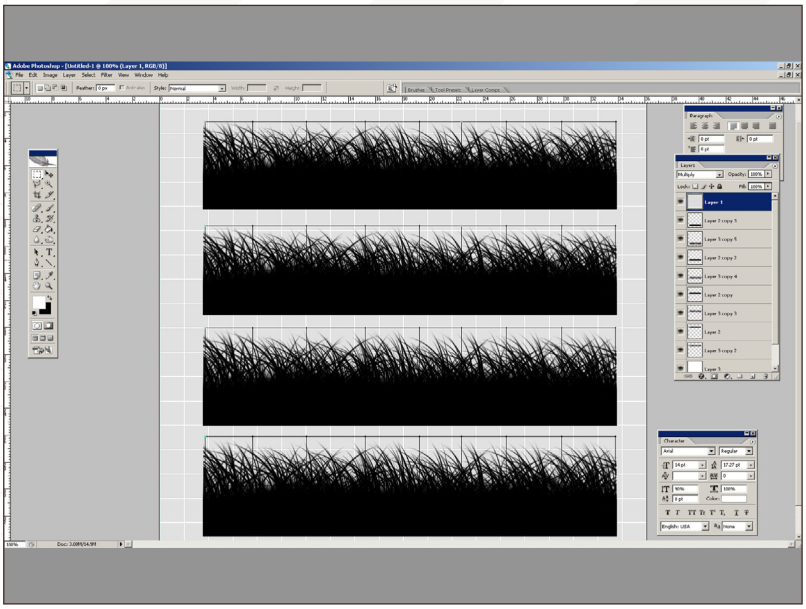


Fig 31

31. Do a print screen of the UV layout in Modeller and paste it into Photoshop. Now simply paint on a strip of fur using the brush. I made a few layers here and flipped them around a few times to break up the uniformity of the hair (**Fig.31**).

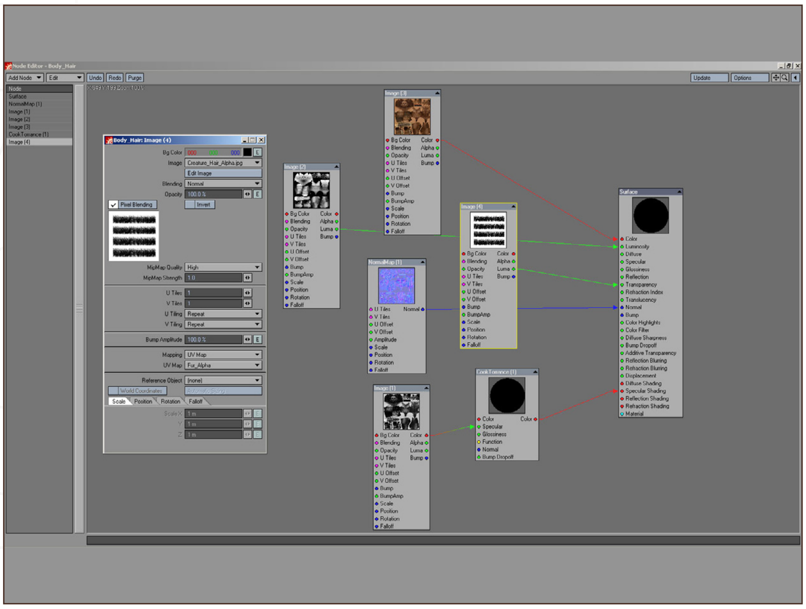


Fig 32

32. The next step is to apply the images to the newly created hair. As we've done so many times before, open up the Surface Editor, select the Node Editor, create a 2D Texture node, load in the Hair_Alpha Texture, set the Map Type to UV and select the Hair_Alpha UV map. Now plug the Luma out into the transparency channel, as shown in **Fig.32**.

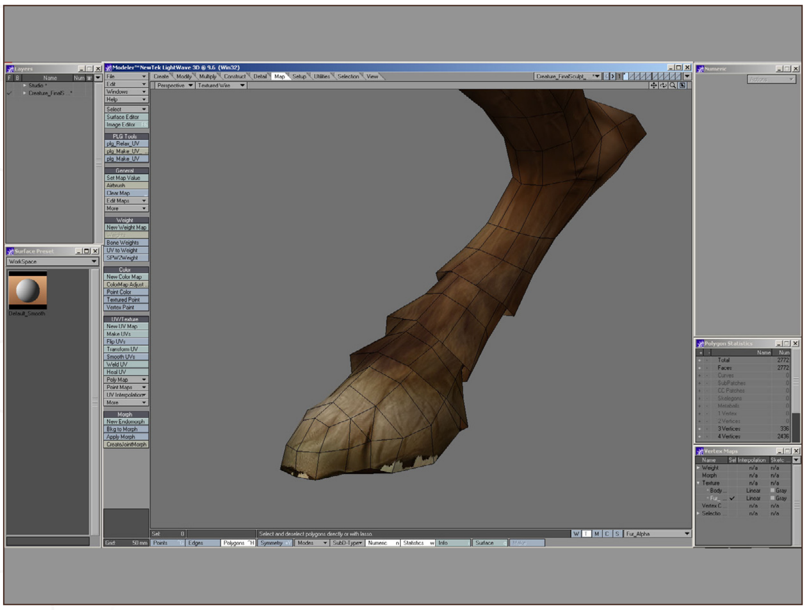
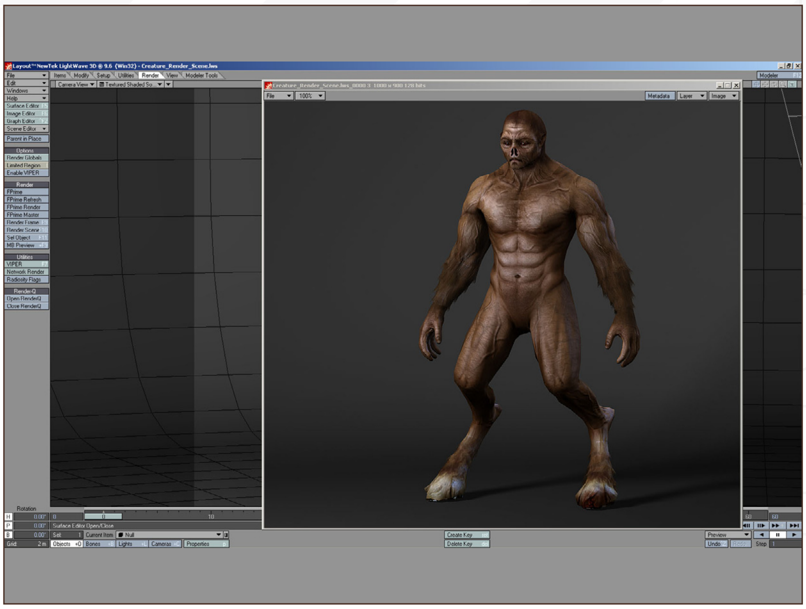


Fig 33

33. Now use exactly the same process as you used to create the arm hair to create the leg hair (**Fig.33**).

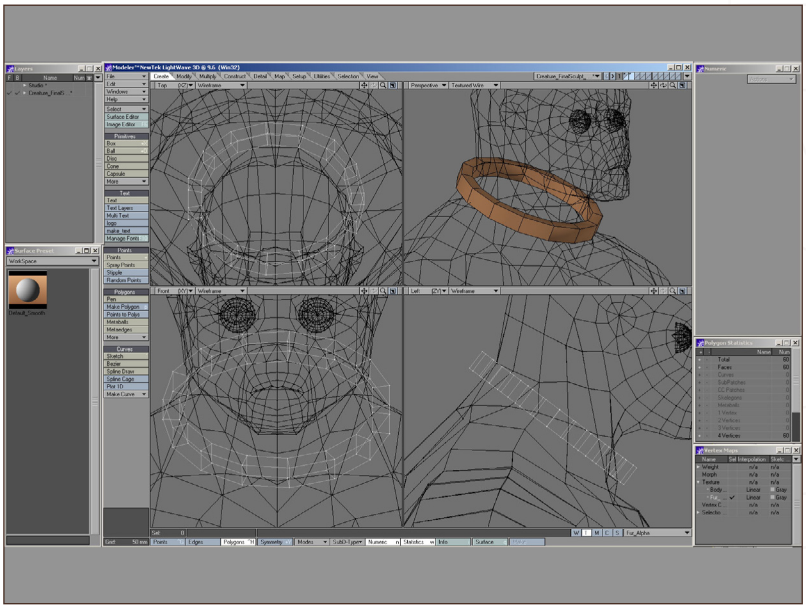
34. Load up the Render scene in Layout and do a quick F9 render. You should end up with something like this (**Fig.34**).

Fig 34



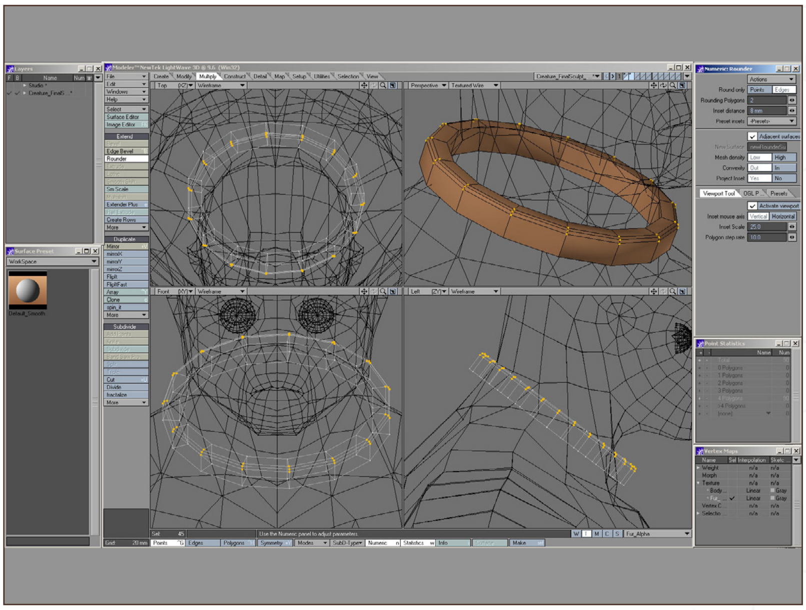
35. It's time to create some accessories. We'll start with the collar and chain. Make a simple disc with about 15 segments, Smooth Shift it in ("Shift + F") and delete the center section. Now use the Extrude tool ("Shift + E") to create a solid ring, as shown in **Fig.35**.

Fig 35



36. Select a ring of verts around the edge of the ring and use the Rounder tool under the Multiply tab to create a softer edge. Do the same for all of the edges of the ring (**Fig.36**).

Fig 36



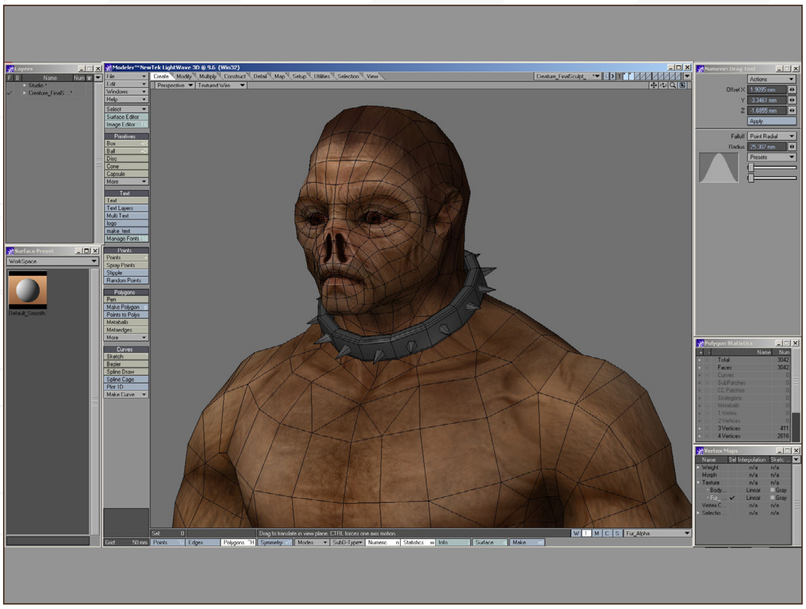


Fig 37

37. To add the spikes simply create a five-sided cone. Rotate and move it into position and then use the copy and paste function to clone it around the collar as many times as you think looks good. Adjust the position and rotation each time until you have something that looks like **Fig.37**.

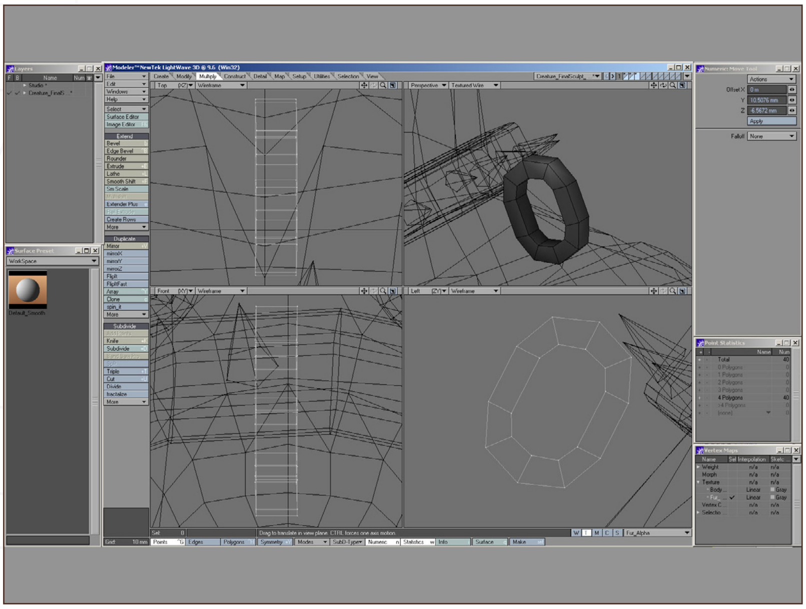


Fig 38

38. Use the same Smooth Shift Extender technique to make one of the chain links (**Fig.38**).

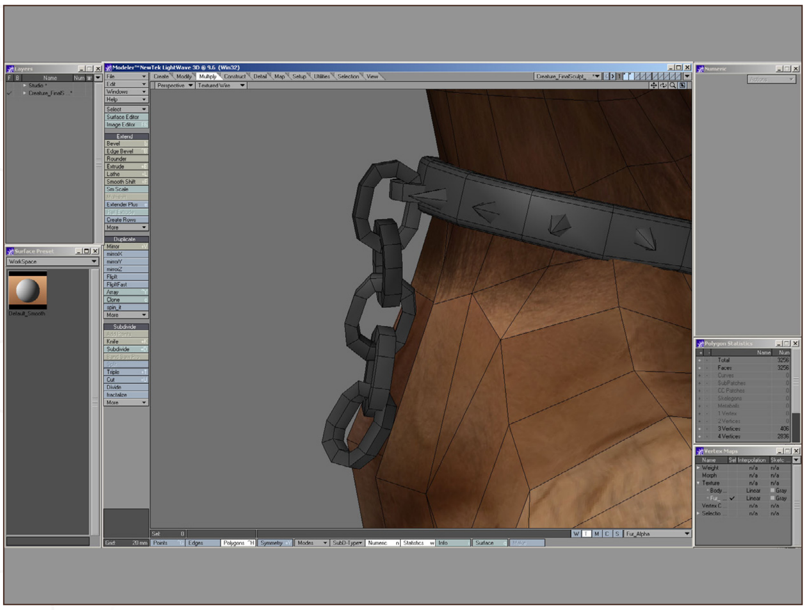
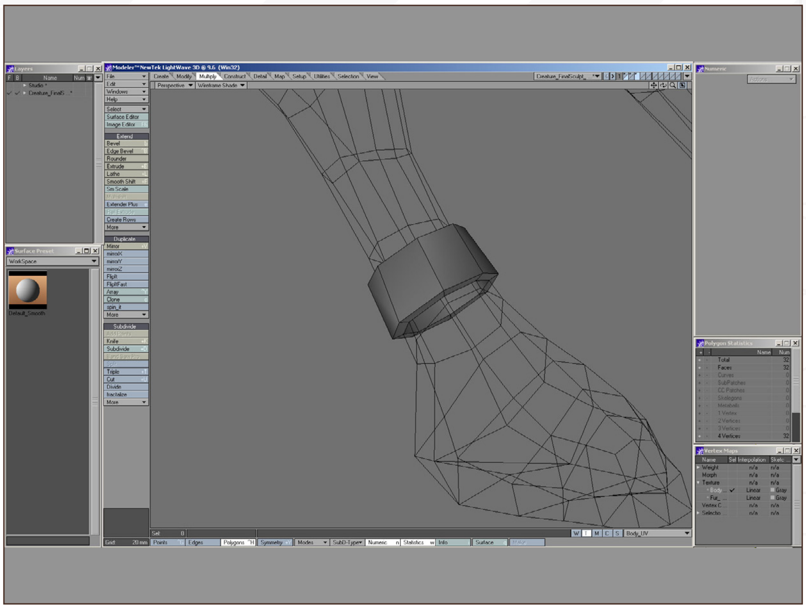


Fig 39

39. Once you've made one you can simply copy and paste it to create the rest of the chain. The link that joins the chain to the collar is created by simply cutting one of these in half and positioning it so that the two open ends are inside the collar (**Fig.39**).

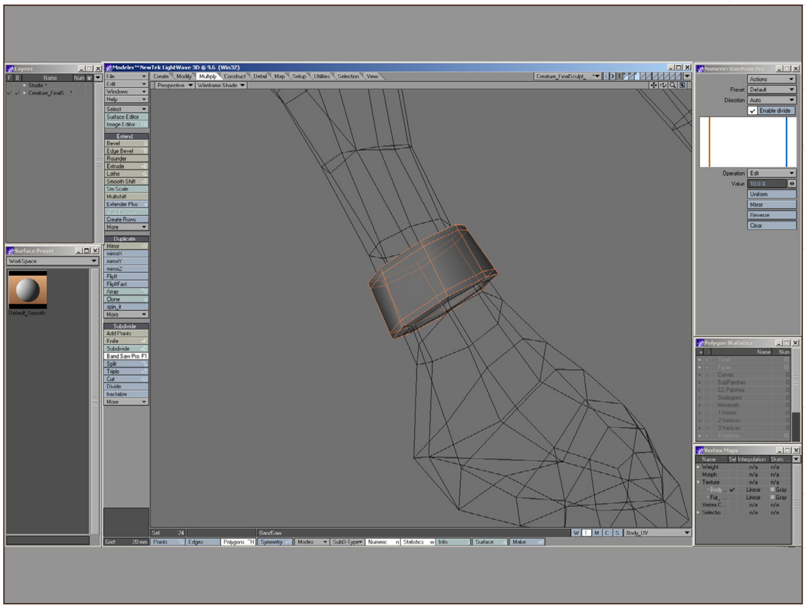
40. Now for the ankle cuffs. These are very simple objects to make. All I did here was create a disk around the leg, use the Smooth Shift tool to give it some depth and then Extender to give it some height (**Fig.40**).

Fig 40



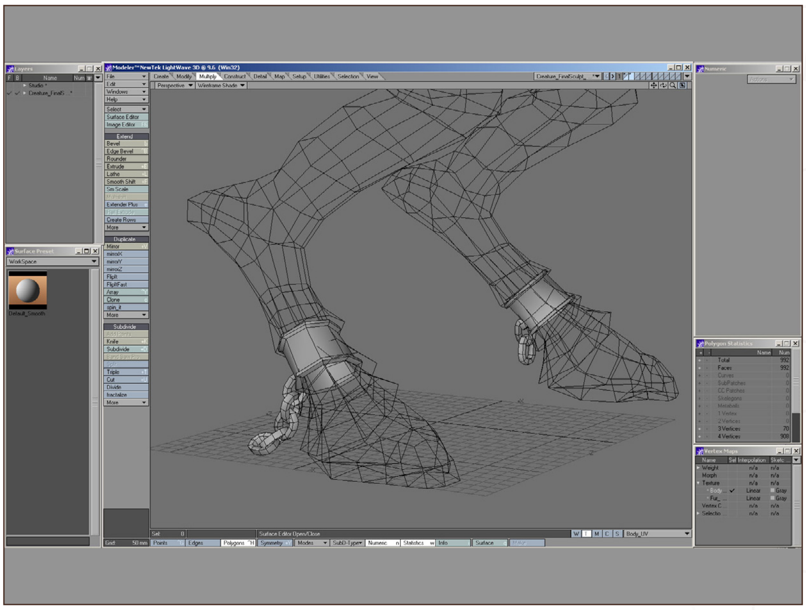
41. To create the edges of the cuffs I used Bandsaw to cut two edge loops at values of 10% and 90% (**Fig.41**).

Fig 41



42. Then I selected the central loop of polygons and used the Smooth Shift tool to pull the polygons in about a cm or so (**Fig.42**). The chains were simply copied from the collar and edited a bit by moving the links around. Very simple stuff!

Fig 42



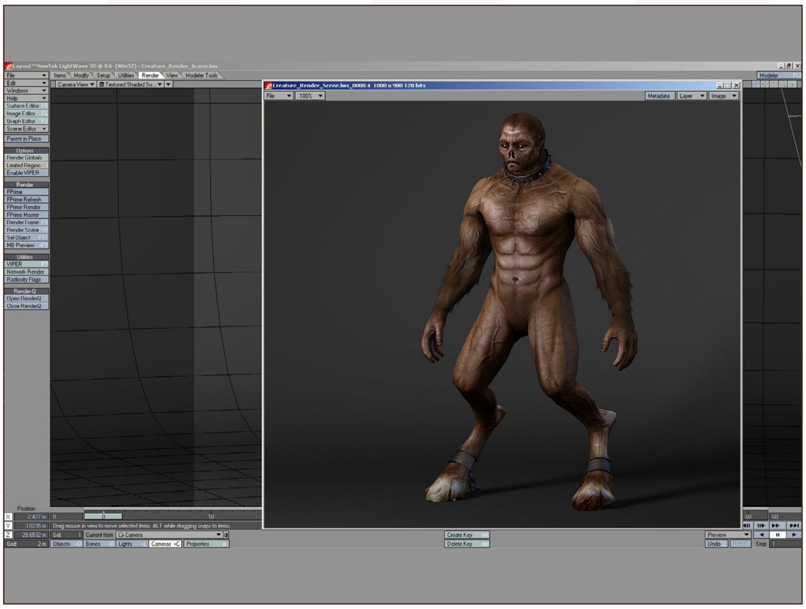


Fig 43

43. I'm sure you're fairly comfortable with the UVing and texturing process using the PLG tools by now. To texture the collar and cuffs all you need to do is unwrap them using the PLG and apply a suitably dirty metal texture. Perhaps one of the 3DTotal's Aged & Stressed textures from the Total Textures: V2 – Aged & Stressed DVD (**Fig.43**).

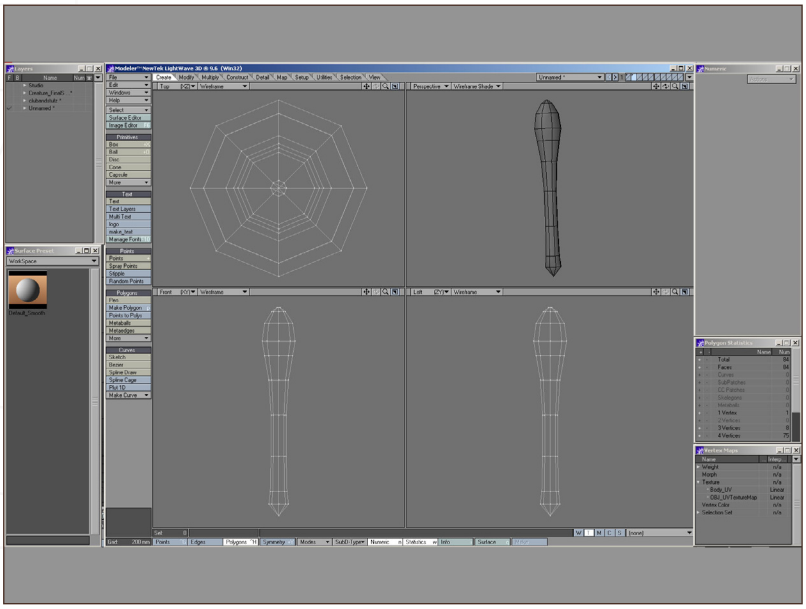


Fig 44

44. Now it's time to create the club. We're going to have to use a bit of ZBrush here to give it the gnarled wooden texture that we're looking for. Start off by creating a simple tube with eight sides and eight or nine divisions. Then select the verts and pull them around using the Move and Stretch tools to create a shape similar to the one shown in **Fig.44**. You will noticed that I've closed off the bottom end by selecting the verts and doing a Weld Average.

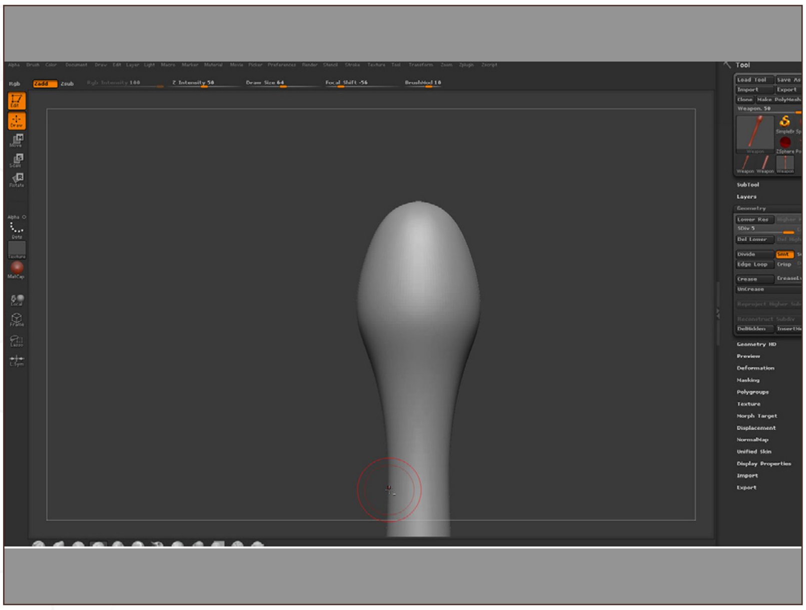
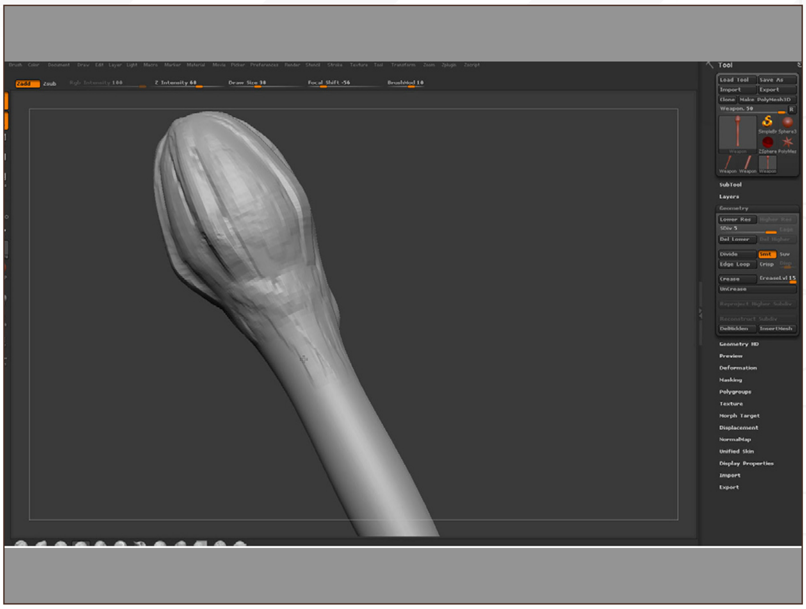


Fig 45

45. That should be almost all the modeling we need to do for our club. We should take it into ZBrush now and create a high poly version for the normal map. Export the object as an OBJ in the same way as we have done before, and import it into ZBrush (**Fig.45**).

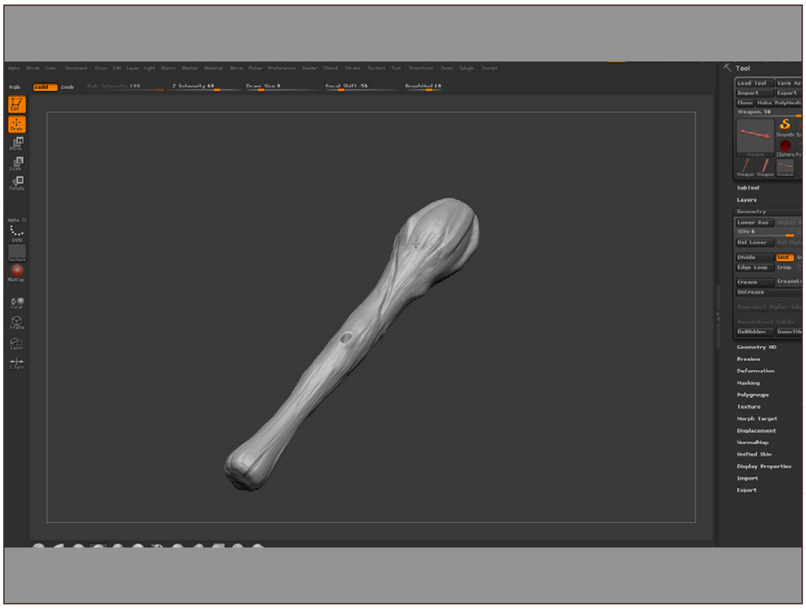
46. Using the Clay tools brush, form the head of the club. You can imagine how, with primitive tools made from rocks, slate and other items found lying around, carving anything beautiful from a big stick would be a challenge to say the least. At least our character has put in the effort! Give the head of the club rudimentary spikes (**Fig.46**).

Fig 46



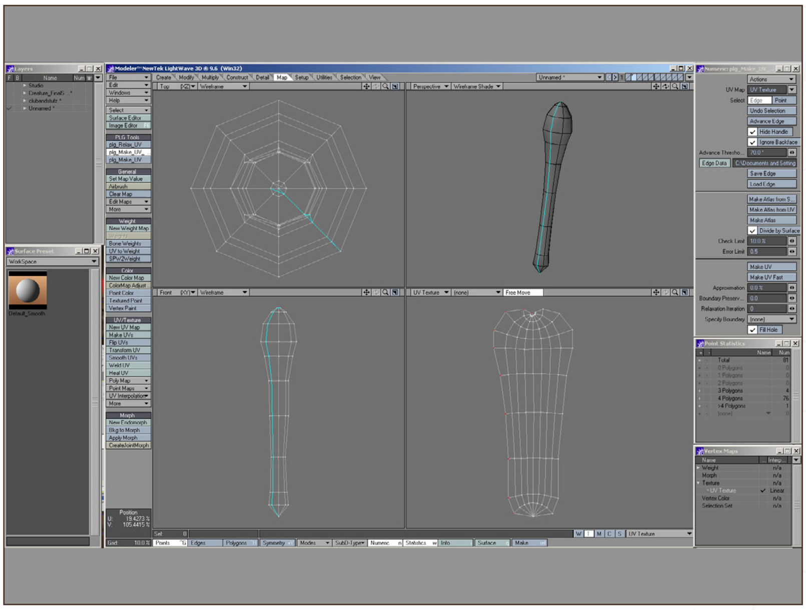
47. Carve into the body of the club now, hollowing out some areas and adding a large indent where it's perhaps gotten caught or scratched (**Fig.47**).

Fig 47



48. Back in LightWave now and I think it's a good time to unwrap our object. We could have done this before, but sometimes it's good to leave it until we know that more modeling will most likely not be required. We can project over the detail already created in ZBrush and be back to the same stage shortly (**Fig.48**).

Fig 48



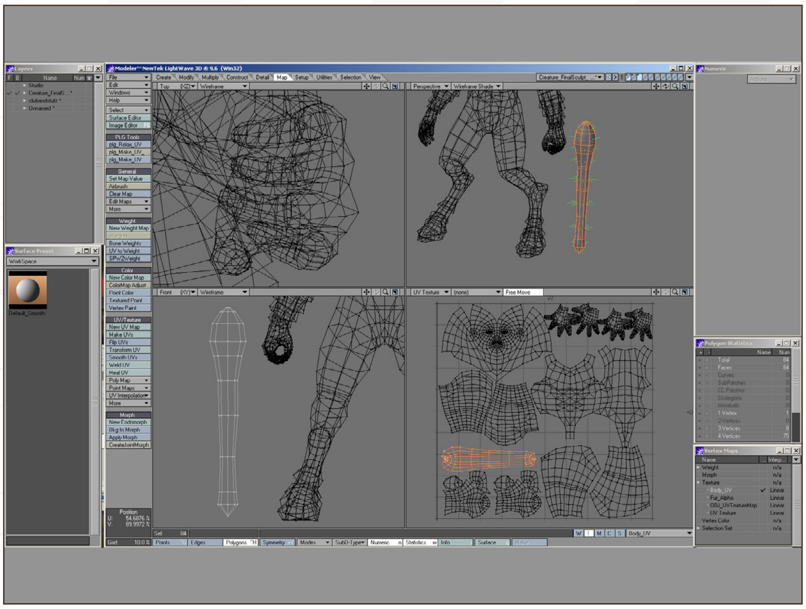


Fig 49

49. Using the knowledge you've learnt throughout this tutorial, use the PLG mapping tools to produce an efficient UV map for the club. Make sure it's an optimum shape for painting on, and it fits in the area of the full character map where we saved a place for it (**Fig.49**).

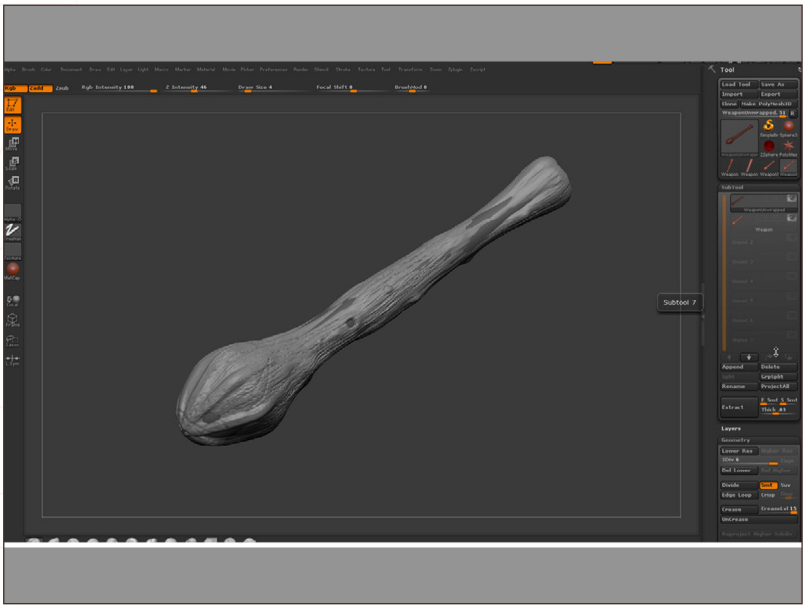


Fig 50

50. Back in ZBrush, with our newly unwrapped model imported, divide it six times to match the resolution of our sculpt-in-progress, and append in our previous sculpt now as a Sub Tool. Check both models are at their highest resolution, and with the new model selected, hit Project All. Delete the old model and continue working on the model (**Fig.50**).

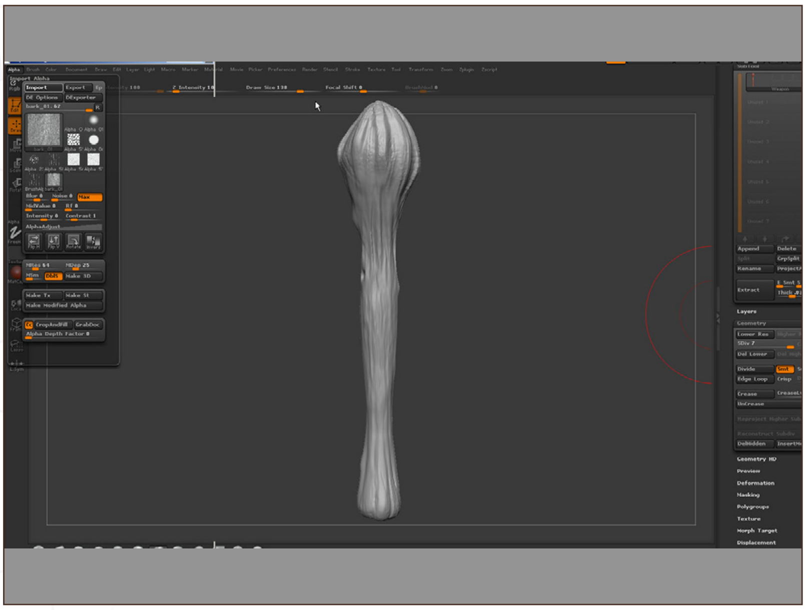
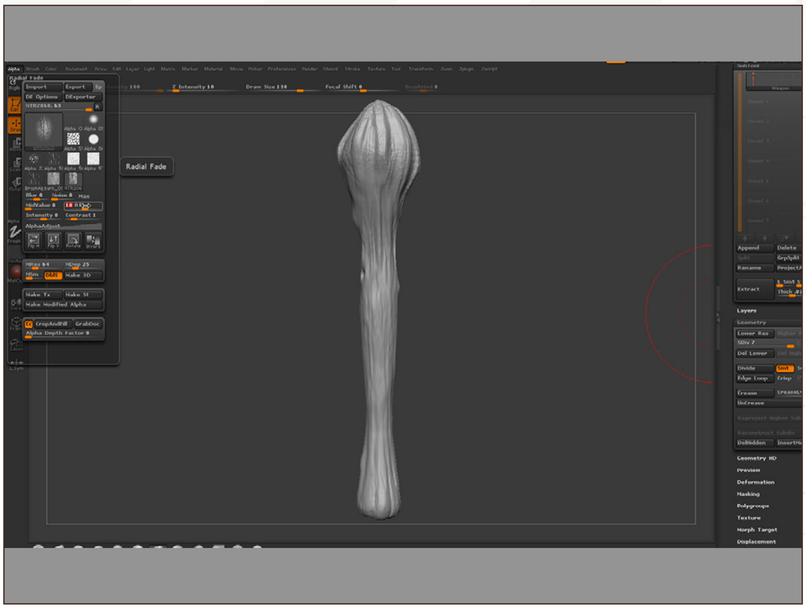


Fig 51

51. Alphas are very powerful in ZBrush for creating detail with brushes, but something we have yet to cover is stencils. Stencils are often overlooked, but are incredibly powerful tools in creating high resolution detail with a lot of control. Under the Alpha menu, select Import and choose a grayscale picture of some tree bark. Concrete, skin, mud and many other images can work brilliantly here, too (**Fig.51**).

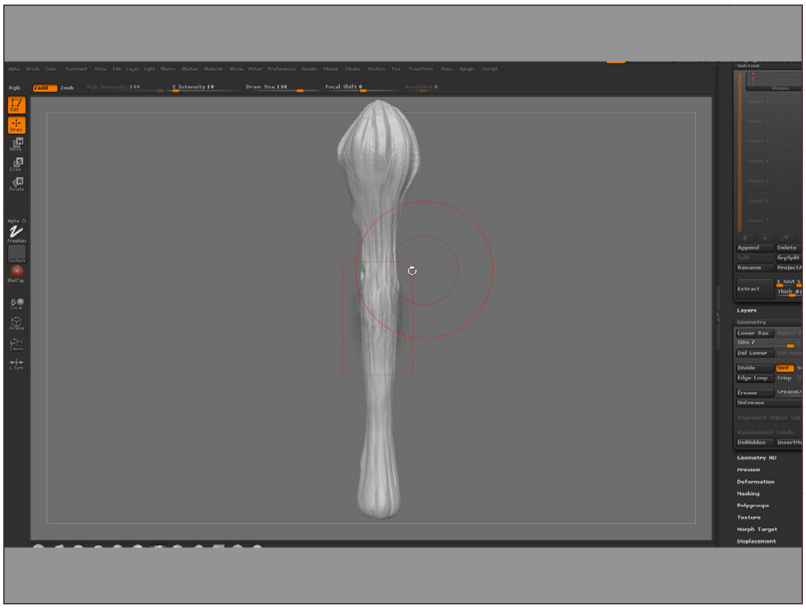
52. Turn up the RF value, which stands for Radial Fade. This will fade out the edges of the alpha and won't give us a hard edge when we sculpt over it. You can also increase the Contrast of the alpha, as sometimes they can be quite dull and produce a noisy texture without any strong recessed or raised areas (**Fig.52**).

Fig 52



53. Once you are done changing settings in the Alpha menu, click on the button labeled "Make St." (Make Stencil). This will switch the Stencil Mode on, using the chosen alpha (**Fig.53**).

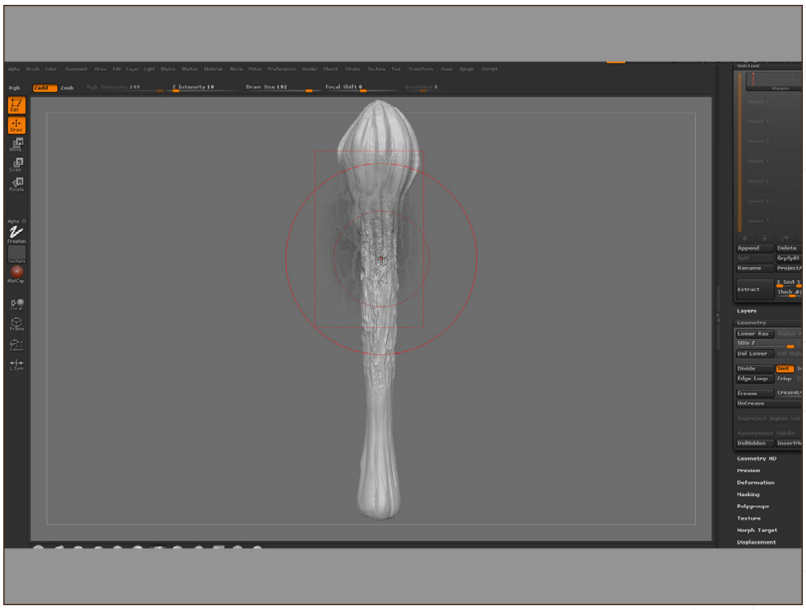
Fig 53



54. Hold down the space bar key to access the stencil manipulation tools. You can use these to scale vertically or horizontally, rotate and transform your stencil.

The stencil basically acts as it sounds; it's like a mask. White areas will not be affected by your brushes, whereas black areas will be fully affected. You may use any brush you wish whilst sculpting with the stencil. I find the Inflate brush, combined with smoothing, can produce the most realistic detail (**Fig.54**).

Fig 54



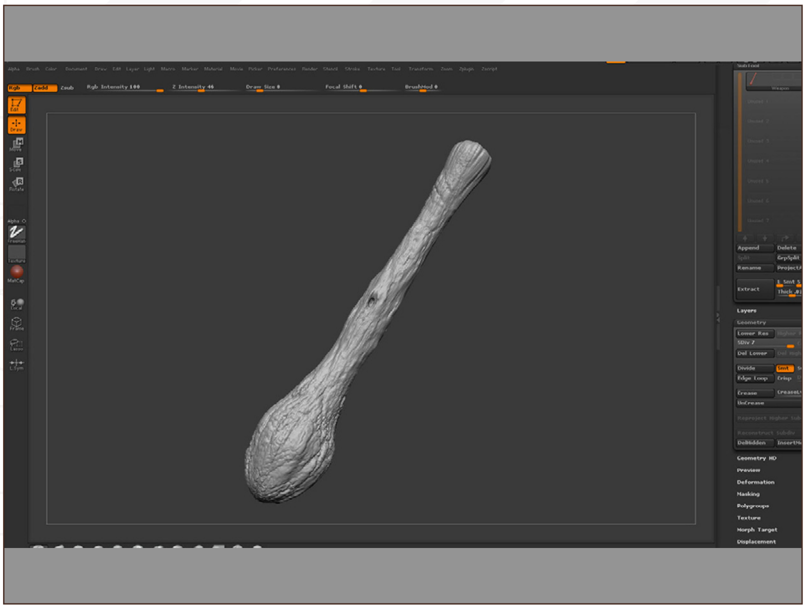


Fig 55

55. Go over your model now, sculpting in detail using traditional style methods and stenciling. Feel free to load in new alphas to try out with the stencils as you can get a huge range of effects this way (**Fig.55**).

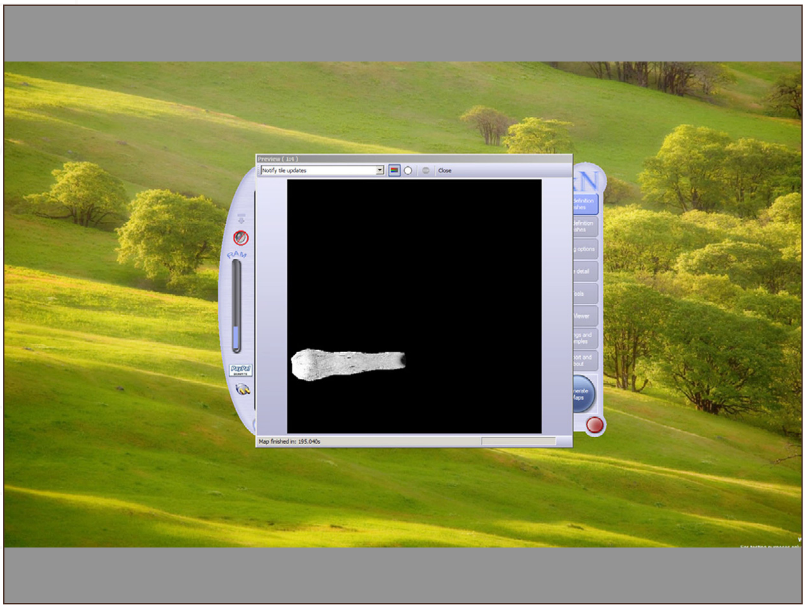


Fig 56

56. Now our weapon is complete, we can follow the same procedure as with our character to create a Normal map and an Ambient Occlusion map. Create those now (**Fig.56**).

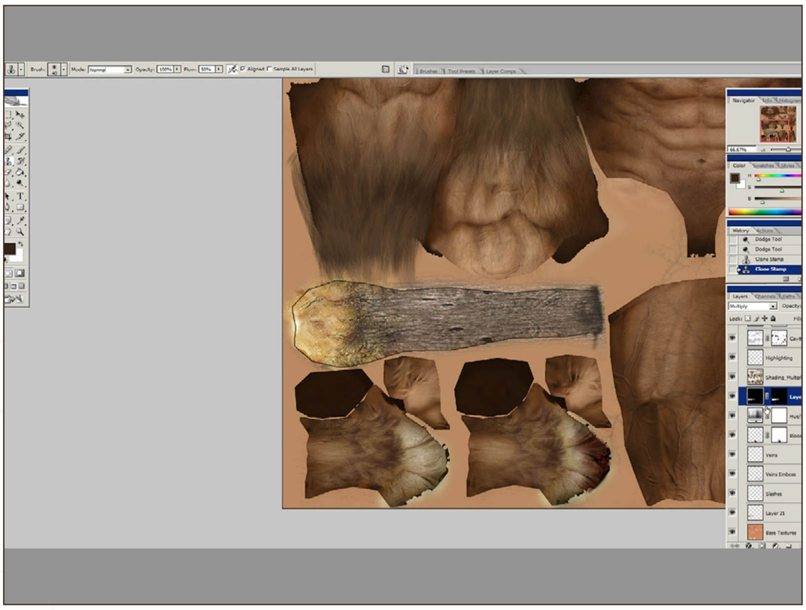
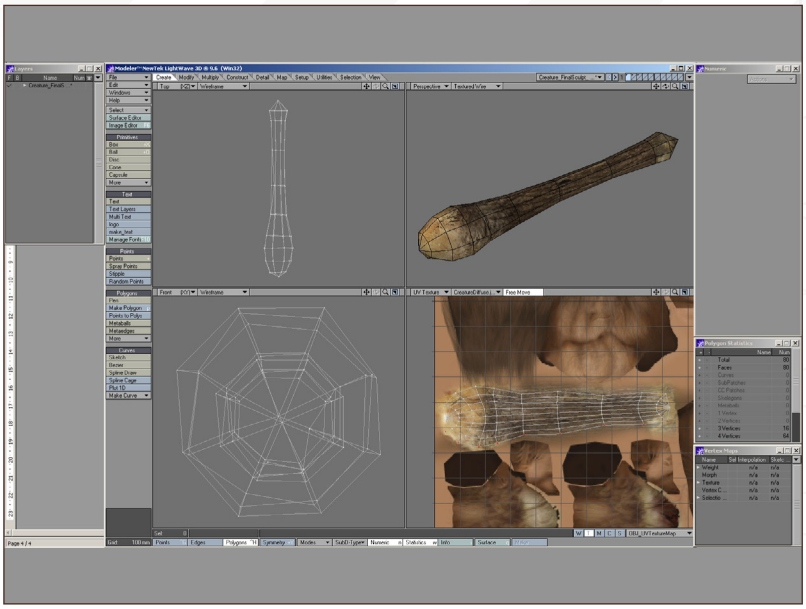


Fig 57

57. I've dropped the Ambient Occlusion map into the diffuse texture, setting the layer mode to Multiply, just as we did with the shading layer. Using a combination of photographs and hand painting underneath it, build up a texture that resembles a fallen branch – the top and base worn and with no bark or covering (**Fig.57**).

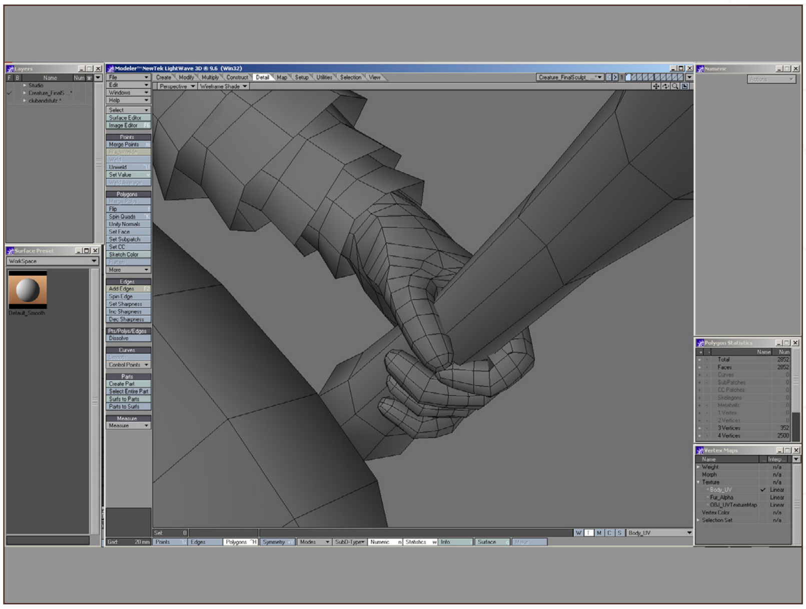
58. To apply the texture to the club simply copy and paste the shader node setup from the Body Shader. Because it uses the same set of UVs and textures it should work perfectly. You might want to unplug the specular node as wood generally isn't that reflective (**Fig.58**).

Fig 58



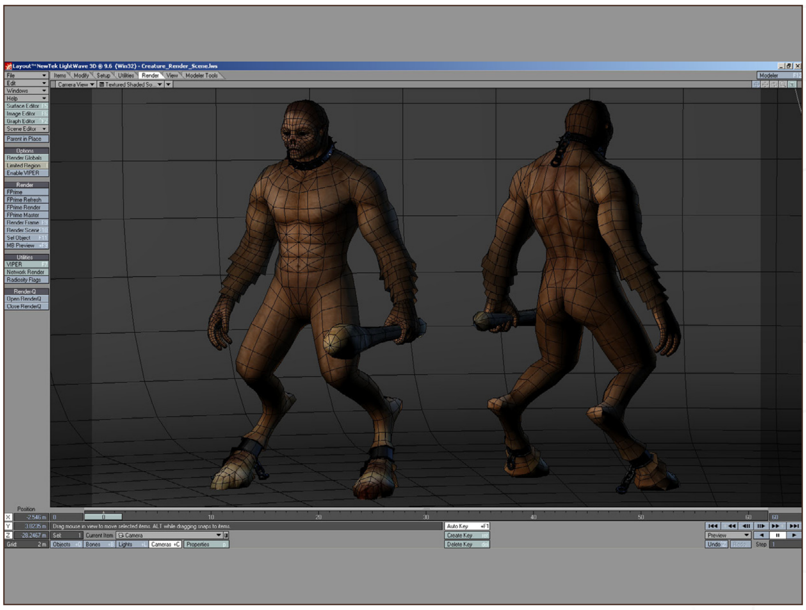
59. You can see here in **Fig.59** that I've adjusted the fingers on the hand to grip the club. I did this by simply selecting the polygons around the fingers and using the rotate tool to bend them into position.

Fig 59



60. And that's most of the work done. Here is a quick preview of the model in Layout. As you can see I've cloned the creature so that we can see him from both the front and the back when we do a render (**Fig.60**).

Fig 60



61. In **Fig.61** you can see the final render of the creature using a very simple lighting rig and only Normal, Diffuse, Specular and Ambient occlusion textures, just as it would be in a game engine.


Fig.61

62. Our character may look complete, but this is a model designed for a game engine and will look even better when running around lit by multiple light sources, self shadowing, and with correct hair shading. It's important to remember that the way it looks in LightWave isn't always the way it will look in-game. If at all possible, try to get the character in-game early on, and keep testing all throughout the process to save time at the end. The difference between LightWave and in-game is illustrated in **Fig.62**. The image on the left is the LightWave render, and the image on the right is the same setup mocked up in the Crytek CryENGINE editor (used to create the PC game Crysis).

Using the techniques learned in this chapter you could go on to create hair on his head and perhaps a bit more on his back and upper legs just to give him a more organic feel.


Fig.62

Congratulations on creating your character up to this point! It's been a long process and we have learnt a whole lot along the way. The games industry is very wide ranging and you might be expected to do all of these steps when building a character, unlike the film industry where you might be responsible for only one or two of these many steps. Creating textures, shaders, modeling and sculpting are all integral parts of a realtime artist's job, and experience with and knowledge of the entire character creation process goes hand in hand with the skills necessary to becoming a great artist. I hope this tutorial has given you a good starting ground for now going off and bringing your own characters to life!

Creature Concept by: Richard Tilbury
Tutorial originally created by Joseph Harford in ZBrush & 3ds Max; translated by James Busby for LightWave

Tutorial by:
JAMES BUSBY
For more from this artist visit:
http://www.ten24.info
Or contact them:
jamie@ten24.info

DOWNLOAD RESOURCES
- FREE LOW POLY MODEL & TEXTURES

NEXT GEN
CHARACTER CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

Chapter 1 – Low Poly Modelling | Jul 09

Chapter 2 – High-Poly Modelling Part 1 | Aug09

Chapter 3 – High-Poly Modelling Part 2 | Sep09

Chapter 4 – Mapping / Unwrapping | Oct 09

Chapter 5 – Normal Mapping – Texturing | Nov 09

Chapter 6 – Materials, Lighting & Rendering

The final installment in this series will discuss setting up a light rig, creating a shader for our character and show how to apply the numerous textures made in the previous chapter. The notion of body hair through the use of alpha maps will complete the character, before concluding with some additional accessories in the form of shackles, a chain and a wooden club.

DOWNLOAD RESOURCES

- Free Low Poly Model & Textures

Chapter 6 - Materials, Lighting & Rendering

Software Used: Maya, ZBrush, Marmoset

Welcome to part six of this realtime character creation tutorial. We've learnt a lot throughout this series from low and high poly modeling to unwrapping, normal map generation, texturing and a whole lot in between. But our journey is not over yet; there are a few steps left before we cross the finish line. In this last chapter, I will cover setting up basic materials in Maya, building accessories for our character, some techniques for creating hair and eyes and, finally, bringing the character into the Marmoset engine for final presentation.

1. We will start by opening the Maya file that contains our most recent low poly model that we have unwrapped and prepared textures for (**Fig.01**).

2. Next we are going to create eyes for our character. Click on the primitive sphere icon towards the upper left of the screen and start click-dragging in the 3D viewport. If your channel back is open you'll notice that, towards the left, options for the sphere are displayed. Enter the vertical and horizontal divisions you would like your sphere to have. I chose 12 (**Fig.02**).

3. Move your sphere to the eye socket of your character. Rotate the eyeball 90 degrees, if necessary, so that the poles of the sphere roughly represent the pupil and iris of an eyeball. With this done, scroll to Modify > Freeze Transformations / Reset Transformations. This will reset the object's pivot point to 0,0,0 in world space (**Fig.03**).

Fig 01

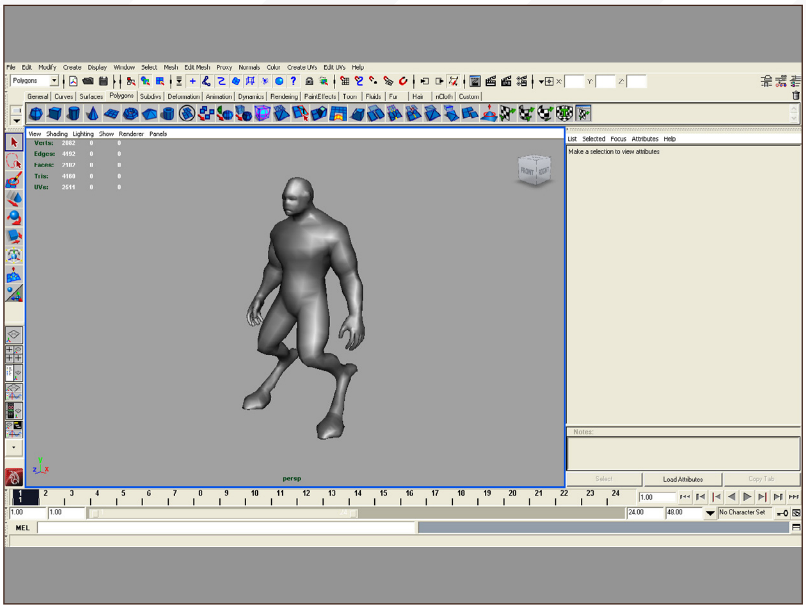


Fig 02

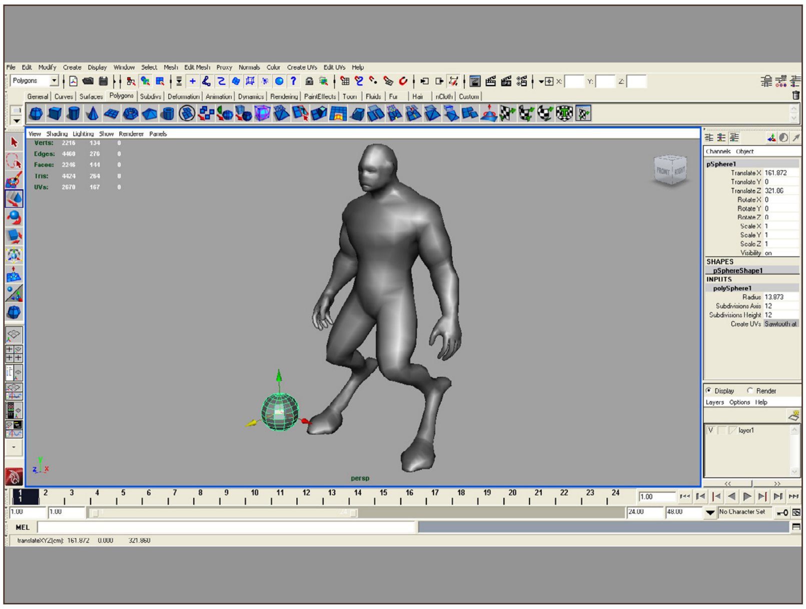
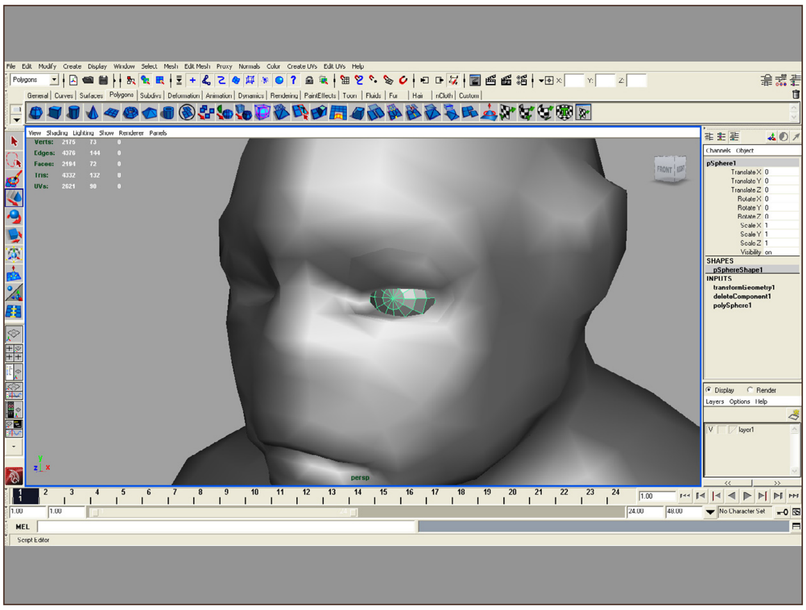
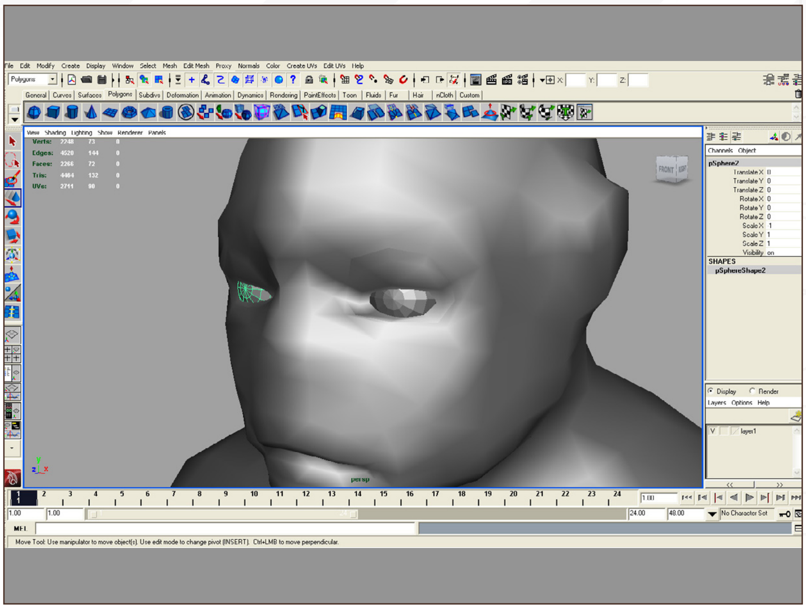


Fig 03



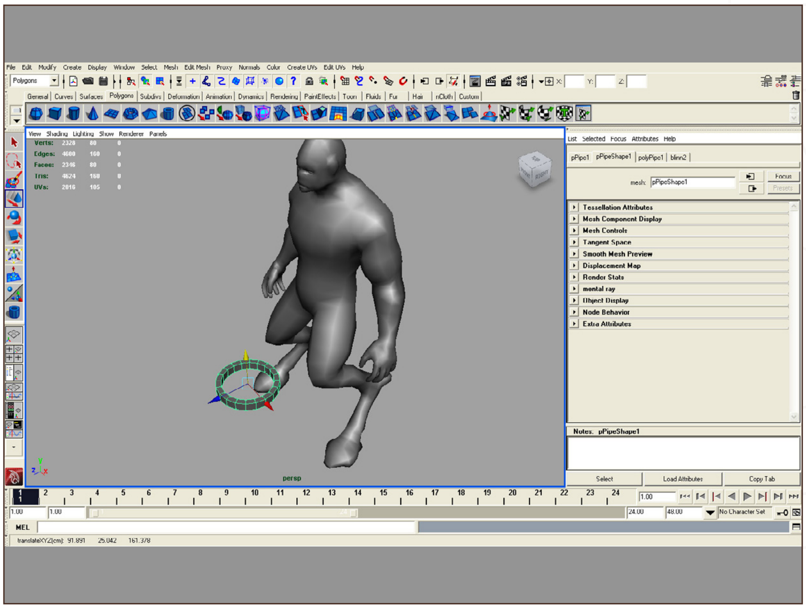
4. Now that the eyeball's pivot has been reset, this makes it much easier to duplicate it symmetrically to fit perfectly into the other side of our character's head. With the eyeball selected, scroll to Edit > Duplicate Special (Options) and make sure that Instance is checked, as well as the value of -1 entered in the Scale of X. As with previous steps, this will cause the instanced model to be a mirrored version of our original model and any change made to one will be propagated to the other (**Fig.04**).

Fig 04



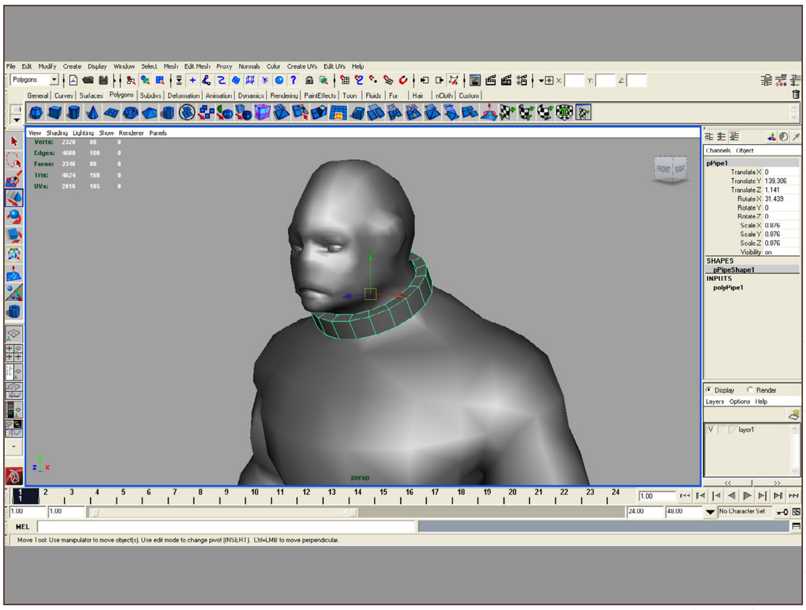
5. With our character's eyeballs in place, it is time to move onto the collar. In the upper left hand corner, under the polygons tab where you found the primitive sphere, you will see an icon for "Polygon Pipe." Just like you did for the sphere, click on this icon and then click-drag in 3D space to begin creating the object. You will be able to control it's radius, height and thickness with three separate clicks of the mouse. Also, like our sphere, you will be able to control the amount of divisions in our geo both vertically and horizontally. I chose 1 for the vertical divisions and 20 for the horizontal (**Fig.05**).

Fig 05



6. This will be the base for our character's collar. Be sure to size it, as close as you possibly can, to the size of the character's neck. Avoid any geometry clipping (one mesh intersecting through the other) or awkwardly large gaps between the neck and collar. After all, this collar is intended to restrain our character; we don't want it to appear as though it can just slip over his head (**Fig.06**).

Fig 06



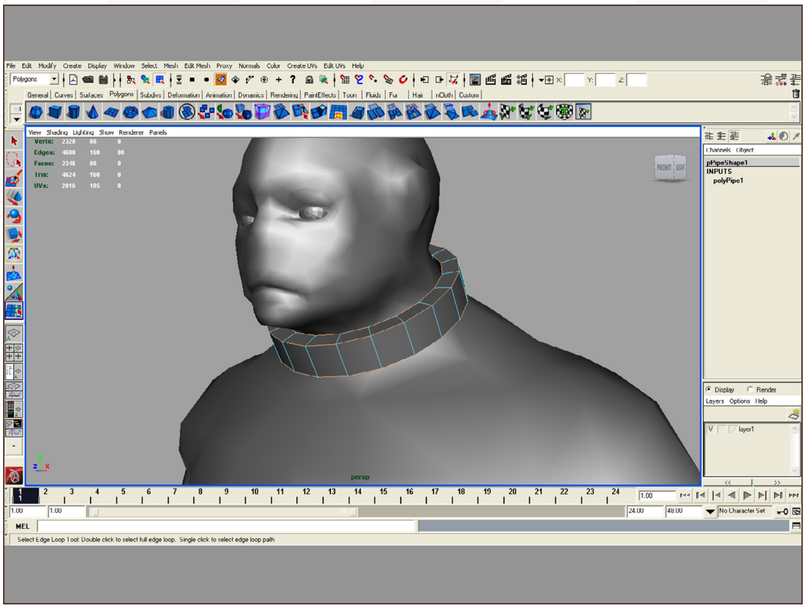


Fig 07

7. Enter edge mode and enter the Edge Loop Select Tool (Select > Select Edge Loop Tool). Double click on the four edges that create the inner and outer rims of the collar (**Fig.07**).

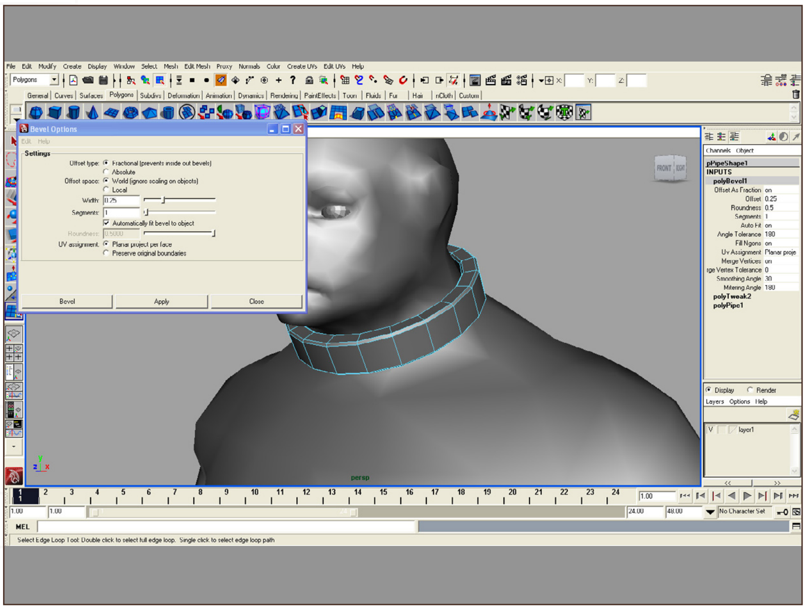


Fig 08

8. With those edges selected, enter the bevel edge tool by pressing Shift + Right Click > Bevel Edge (Options). You will be presented with a menu that allows you to enter the width of your beveling. I chose 0.25. This will add roundness to our edges that will catch highlights from the realtime lighting in our game engine. Also, since no corner is “truly” a 90 degree angle, it is sometimes good to round off corners that will be constantly visible to the audience (**Fig.08**).

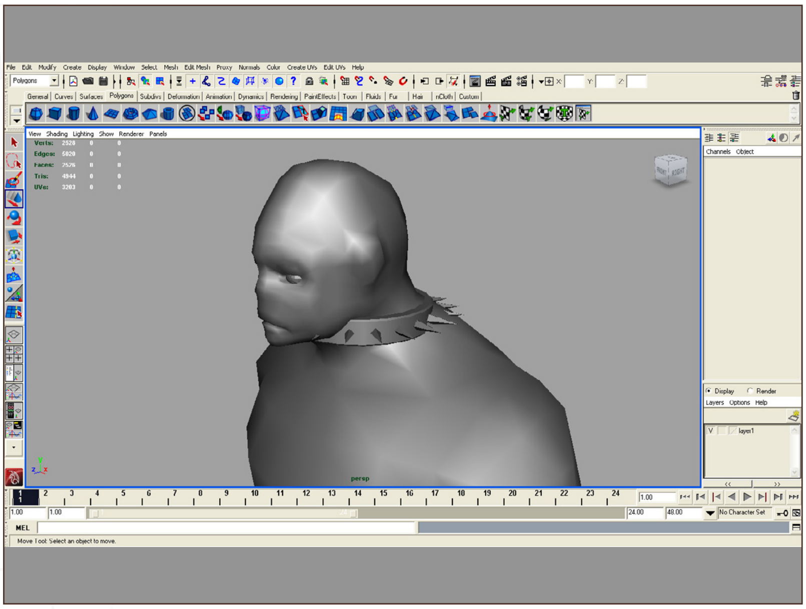
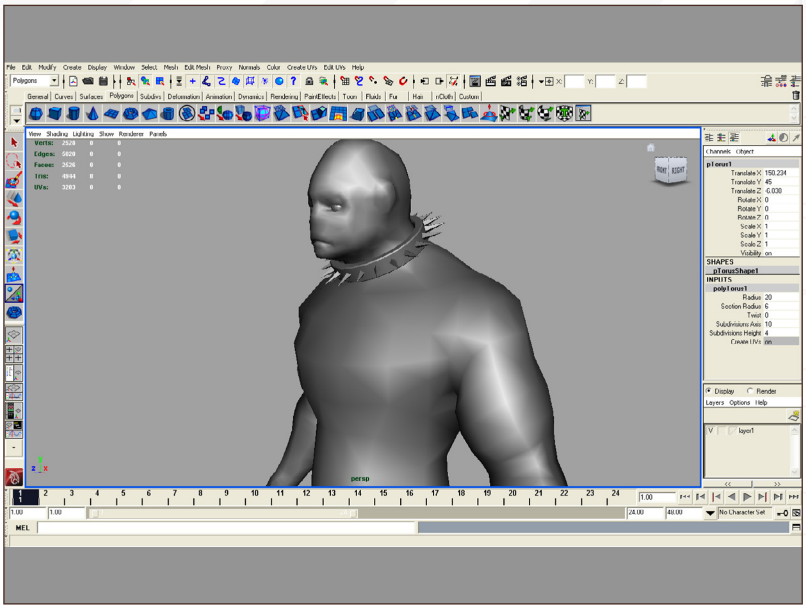


Fig 09

9. Next, create a primitive cone in the same way that you created the eyes and the collar. Set it’s divisions to three; this will be one of many spikes on our character’s collar. Select the collar, take note of it’s rotations (copy them down or just keep the figure in mind) and set them to 0. This will straighten the collar back out temporarily. Position the spike to the side of the collar so that the spike is facing outwards, obviously. Freeze and Reset it’s transformations so the pivot returns to 0,0,0 in world space. Now, we want to have spikes surrounding our collar. Doing some simple math, I wanted to find a number of spikes that would fit into a perfect circle. A circle being 360, ours having 20 sides, I created 18 spikes (360 / 20 = 18). With the spike selected, scroll to Edit > Duplicate Special (Options). Set the options to Duplicate, make sure there are no scaling factors and set the rotations in X to be 20 with 18 copies (**Fig.09**).

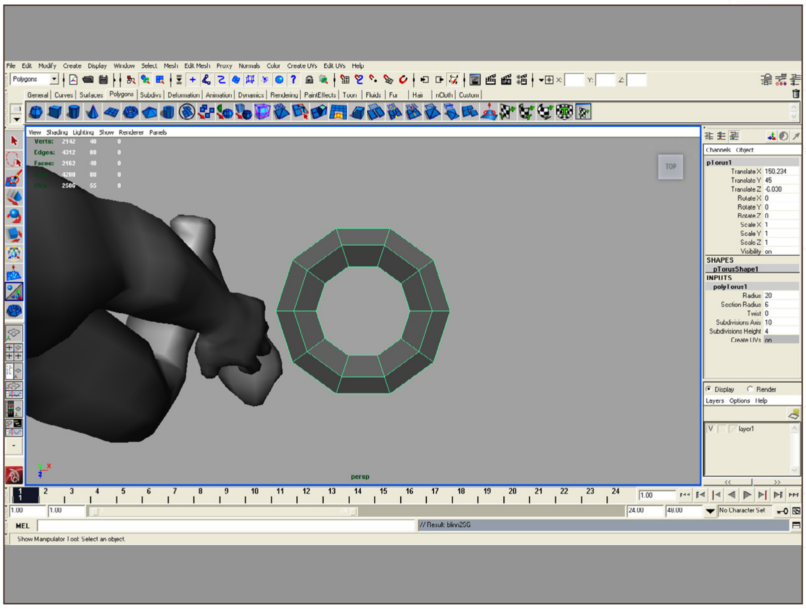
10. Finally, with all of the elements selected, scroll to Mesh > Combine. This will combine all of the models into one single mesh, though still multiple elements. Be sure to clear the objects' history. Once all of this is done, rotate the collar back to where we had originally placed it (**Fig.10**).

Fig 10



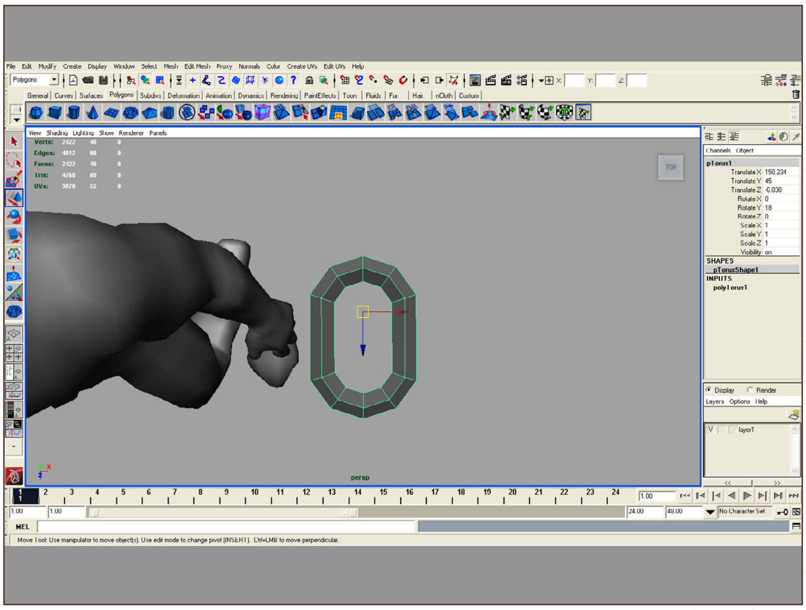
11. In our character concept, there are chains coming from the collar. To make these chain into links, simply create a primitive torus object (located near the other primitive objects you created before). Like the other primitive objects, you will have the ability to add divisions on the vertical and horizontal edges. I chose 10 and 4. Four sides will be enough as we will be instancing this model quite a bit and the extra triangles could start to add up (**Fig.11**).

Fig 11



12. Rotate the torus so that the top and bottom edge loops, from the top view, are running straight down the Z axis. Take the lower half of the vertices of your torus and move them down to elongate the shape (**Fig.12**).

Fig 12



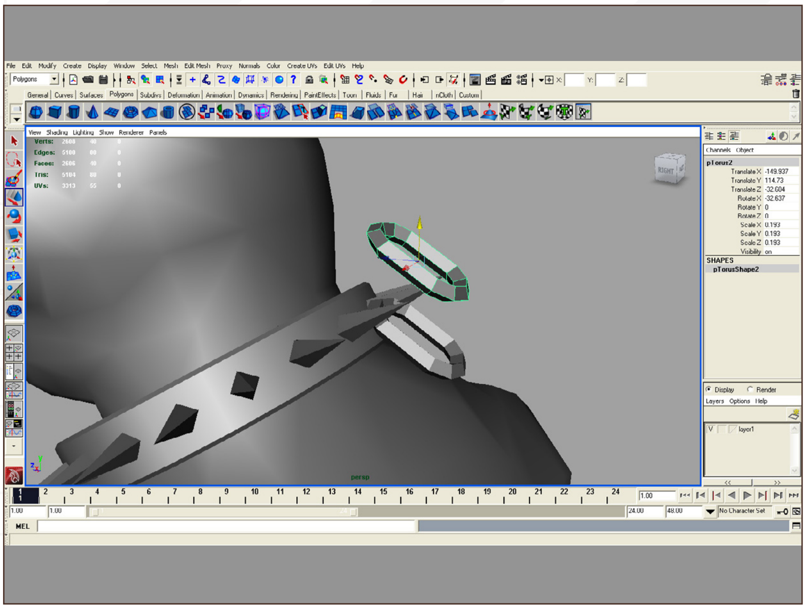


Fig 13

13. Position the chain link towards the back of the collar, like in our concept (**Fig.13**).

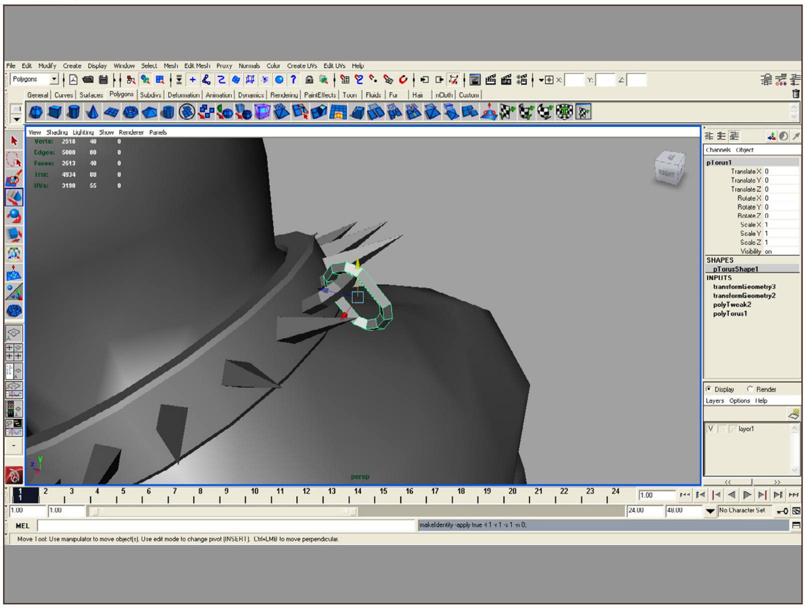


Fig 14

14. Duplicate the link – just a simple duplicate model, not an instance – and delete half of the polygons. Rotate this new, half link and position it into the collar so that the geometry is intersecting. This link will serve as the connecting point for our chains. If one of your spikes is in the way and preventing this, feel free to delete the spike (**Fig.14**).

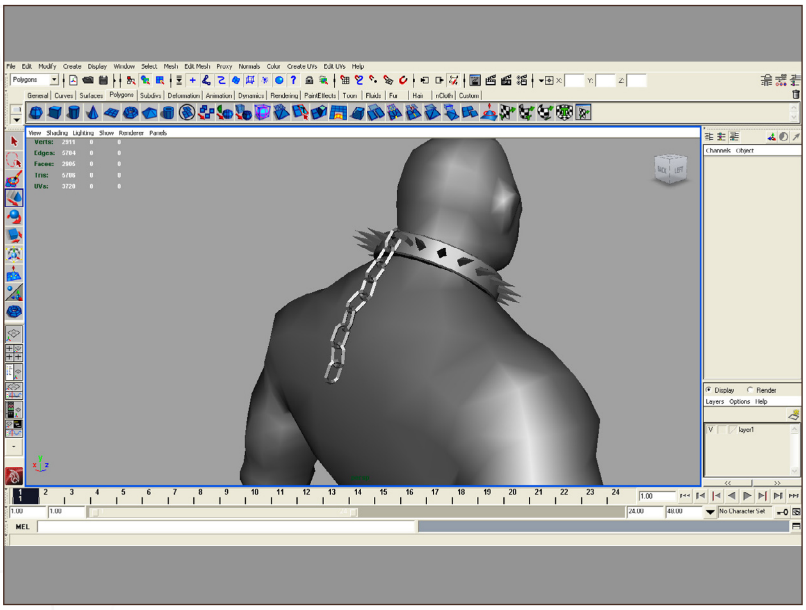
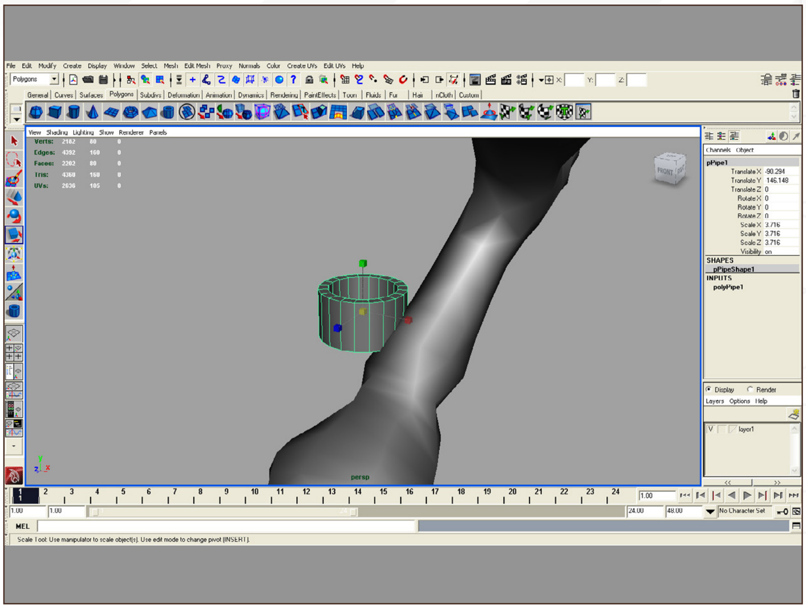


Fig 15

15. To finish off our four chain model, we are going to duplicate the complete link, rotate it about 90 degrees and move the link down so that the top of the new link is resting on the bottom of the previous link. Try to keep in mind the effects gravity would have on the chain. This will help you understand how the links would interact with each other and will assist you with link placement (**Fig.15**).

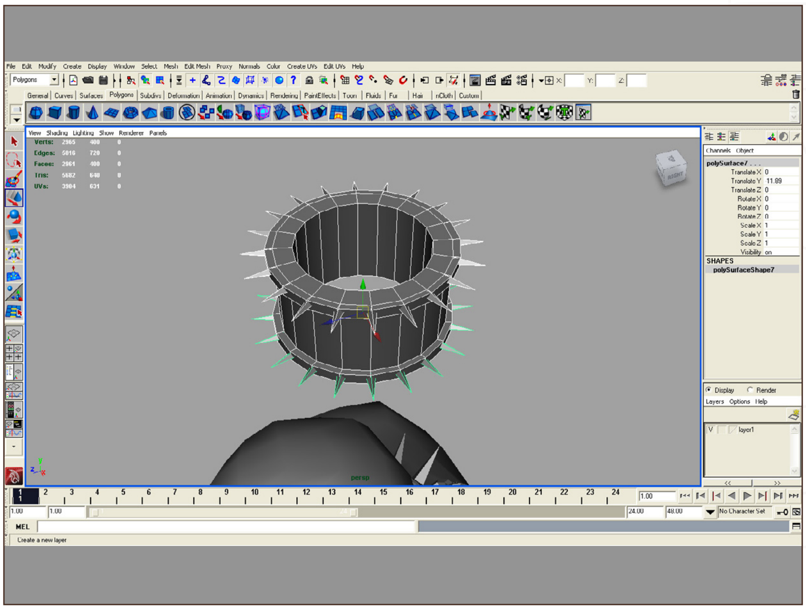
16. Now we are going to move onto the shackles that are around our character's ankles. Just like the collar in previous steps, create a polygon pipe and size it to be roughly the same width as the ankle (**Fig.16**).

Fig 16



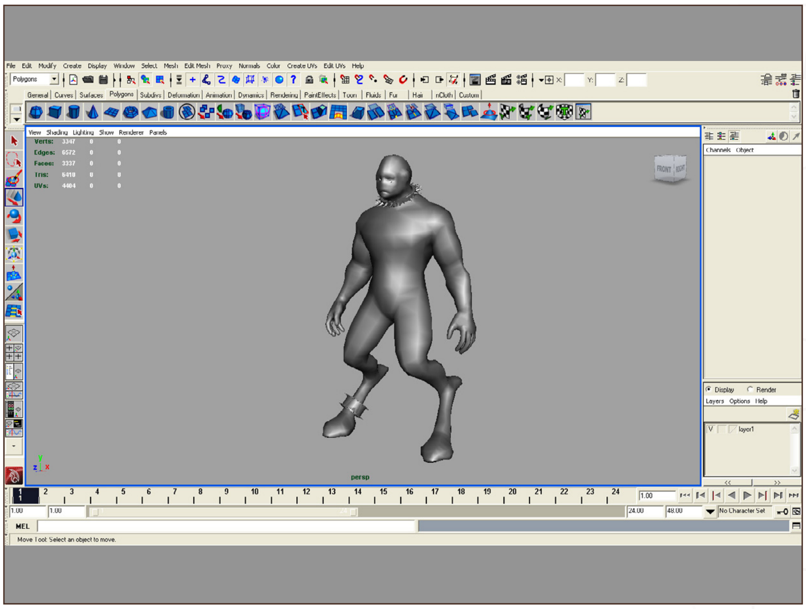
17. Next, also like in previous steps regarding the collar, create a spike (or use one of the previously made ones) and position it to the side of the new shackle base you've created. Scroll to Edit > Duplicate special (Options) and duplicate the spike 20 times with an 18 degree rotation. Select all of these spikes and merge them together. Delete the history and move this new object, which is made of all our spikes, duplicate it and move the duplicate to the lower end of the shackle. Select both spike rings and the shackle and merge the objects together (**Fig.17**).

Fig 17



18. Position the shackle on top of the ankle. Follow the same principles as the collar, trying to avoid any major geometry intersections but also making it tight enough around the ankle so that it doesn't look like it would just fall off (**Fig.18**).

Fig 18



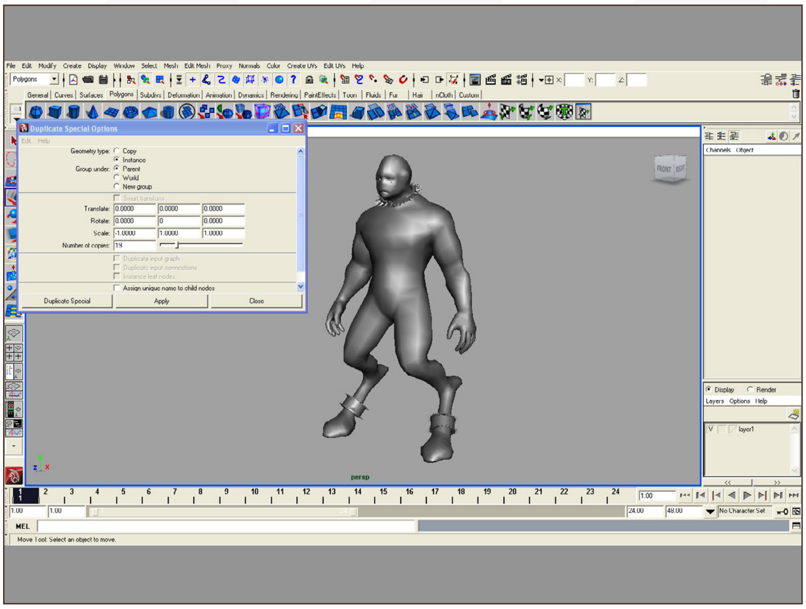


Fig 19

19. With the shackle selected, scroll to Edit > Duplicate Special (Options), remove any rotation values that have been previously entered as well as changing the number of duplicates to just 1. Enter -1 as the scale value for X. This will mirror our shackle onto the other side of our character. Select both shackles, clear the history and Freeze / Reset Transformations (**Fig.19**).

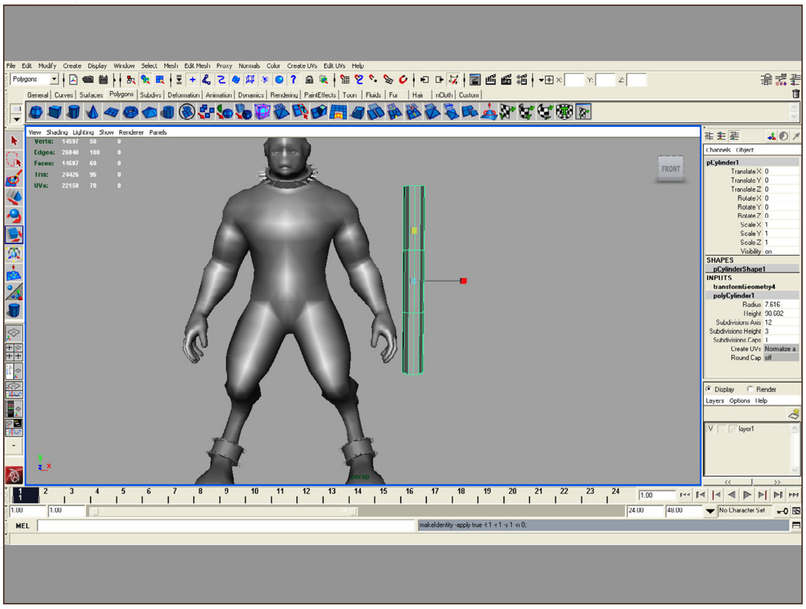


Fig 20

20. Now we are going to create the weapon for our character. Imagine how desperate our character would be, his situation and the time period that he would be in. Most likely, he wouldn't have access to high tech, fancy weapons and, given the resources he would have, a club fashioned from a fallen branch seems very fitting. Create a primitive cylinder and enter the divisions like you did in previous steps. Divide the edges vertically 3 times, by entering the value of 3 in "Subdivisions Height" and give the cylinder 12 sides (**Fig.20**).

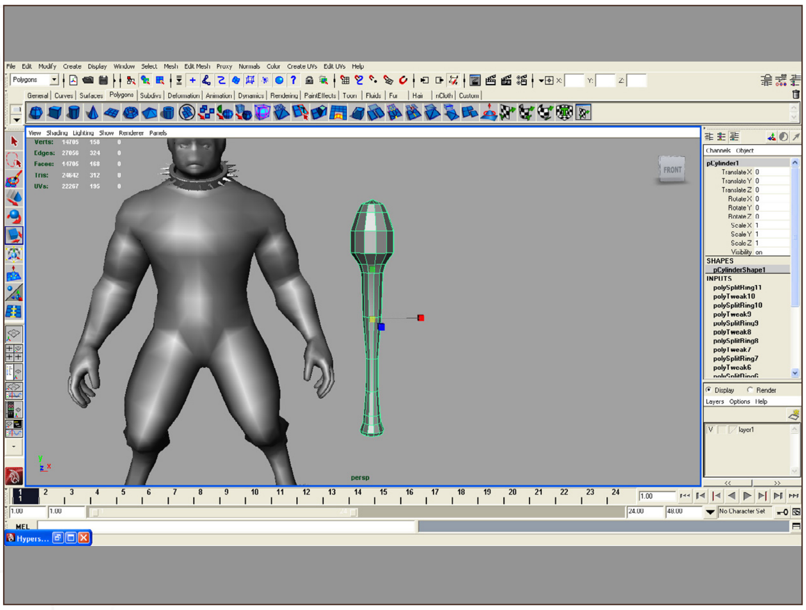


Fig 21

21. Examine the shape of our character's weapon in the concept. The bigger, wider end of the club has been carved down to somewhat form the head of a mace. The body of the club also has a taper for a better grip and the opposite end of the club has a sharp flare, like a baseball bat, to prevent it from flying out of our character's hands when he takes a big swing. Insert edge loops into the cylinder to form these areas (**Fig.21**).

22. The final stages of our modeling process will be creating the alpha planes for our character's hair. Hair in video games has always been notoriously hard, and unless a genius comes up with something revolutionary, it will stay that way for a while longer yet. There are a few ways to create hair in Maya in realtime, those being with a shader and with alpha-mapped planes or geometry. Fur or hair shaders can be expensive in memory, and often end up simply looking fuzzy and blurry. They can be used to good effect on models like teddy bears or furry animals, but when it comes to the hair of a human or a long haired animal, they fail miserably.

A better solution – although not a perfect one – is to use planes or tubes that are painted to look like hair. Using an alpha map, these objects can be transparent in certain areas, giving the impression of strands of hair.

We will begin by selecting an edge loop near our character's elbow (**Fig.22**).

23. Convert the edge selection to faces and scroll to Duplicate (Options). You will be presented with an options menu; chose to separate the duplicated faces. This will create a new object out of the faces that you had selected. You can enter a small offset to move this object off of the surface of the character model or can simply scale the object up just a touch to manually offset it (**Fig.23**).

24. Take the lower border of edges and move this down towards the wrist, slightly fanning it out to avoid any intersection with the character model geometry (**Fig.24**).

Fig 22

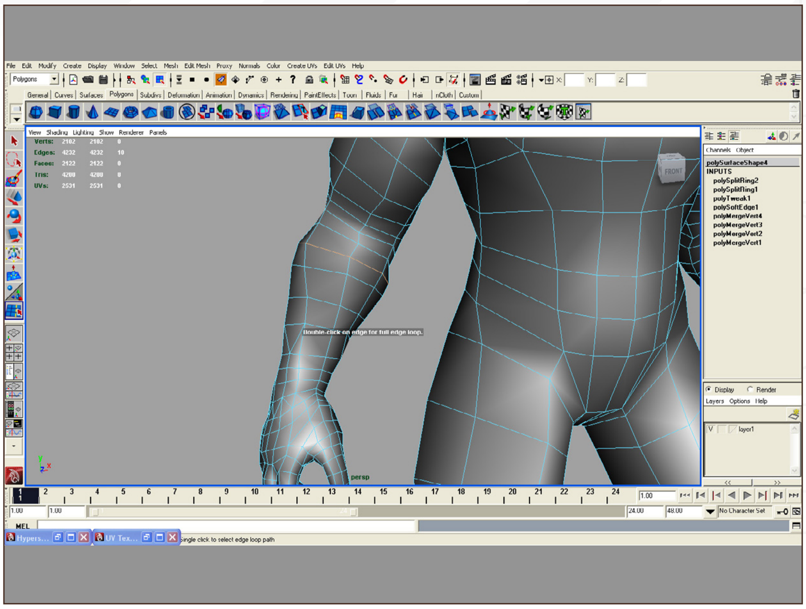


Fig 23

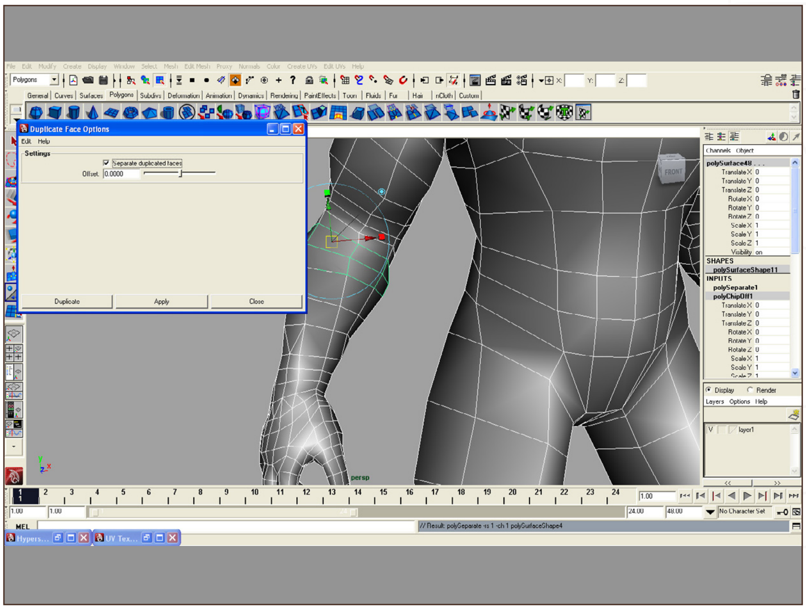
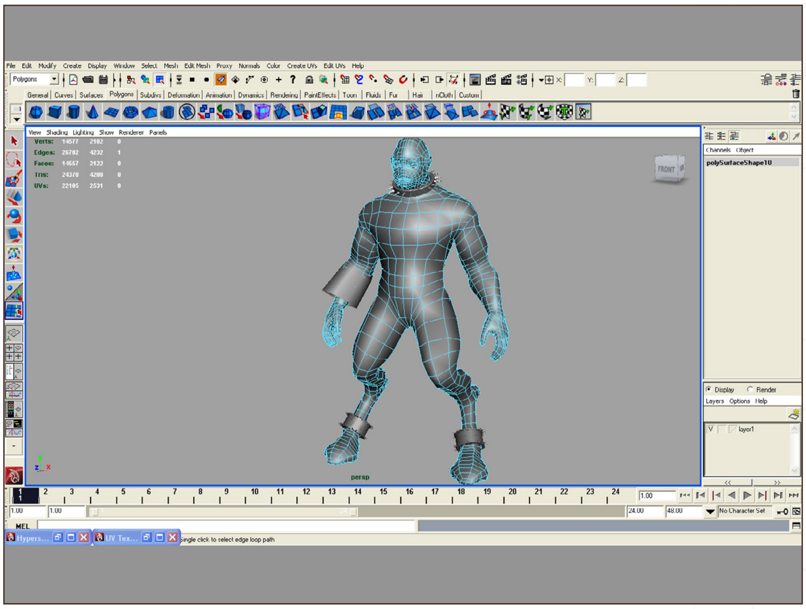


Fig 24



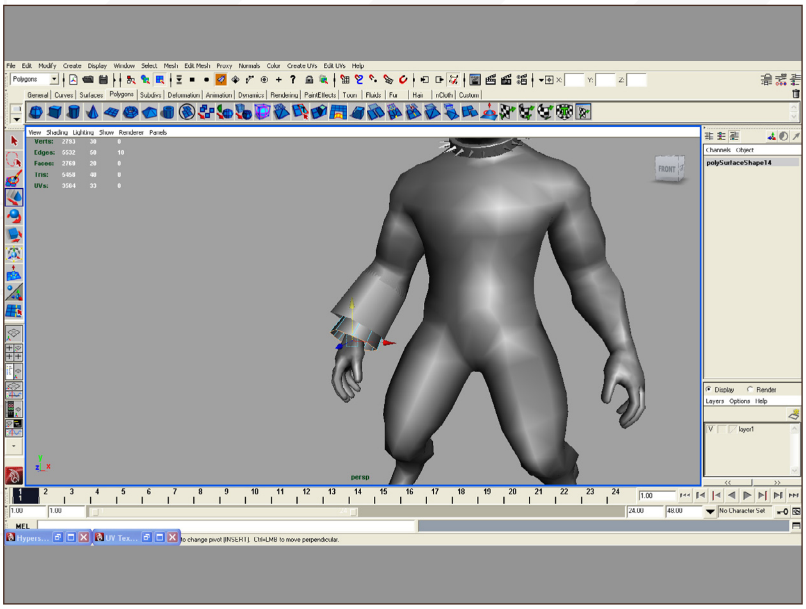


Fig 25

25. Duplicate this object and move the new object towards the wrist to create a layered effect, scaling in edges as needed to closely fit the character model (**Fig.25**).

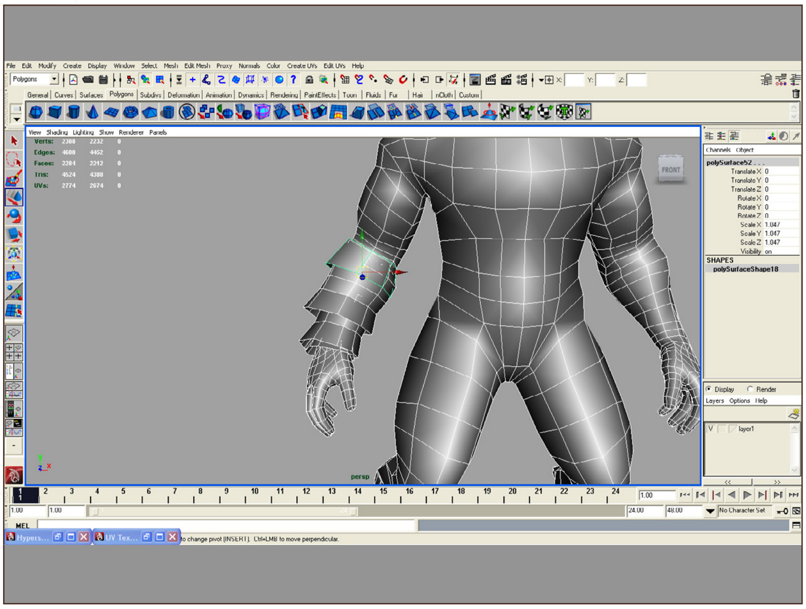


Fig 26

26. Add more edges to the model and conform them to fit the arm. You can adjust the lower ends of each cylinder to splay out from the arm, to give the silhouette and the shadow a hairy look. Duplicate the cylinder once more if necessary, and move it to cover the wrist. Sometimes this kind of covering up can be as much for design reasons as to hide seams or ugly deformations in animation. Our character has been well built and should not suffer from that. Merge the planes together for better management and clear the history as well as Freeze / Reset the transformations (**Fig.26**).

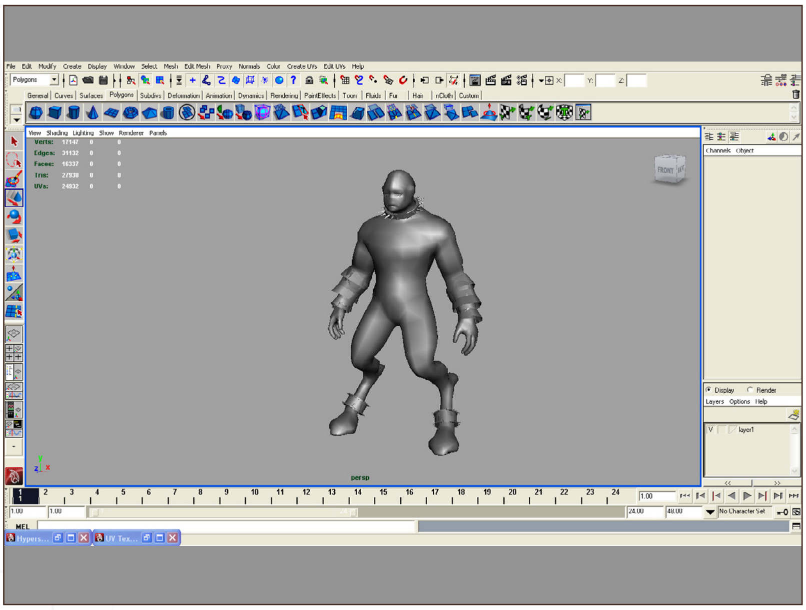
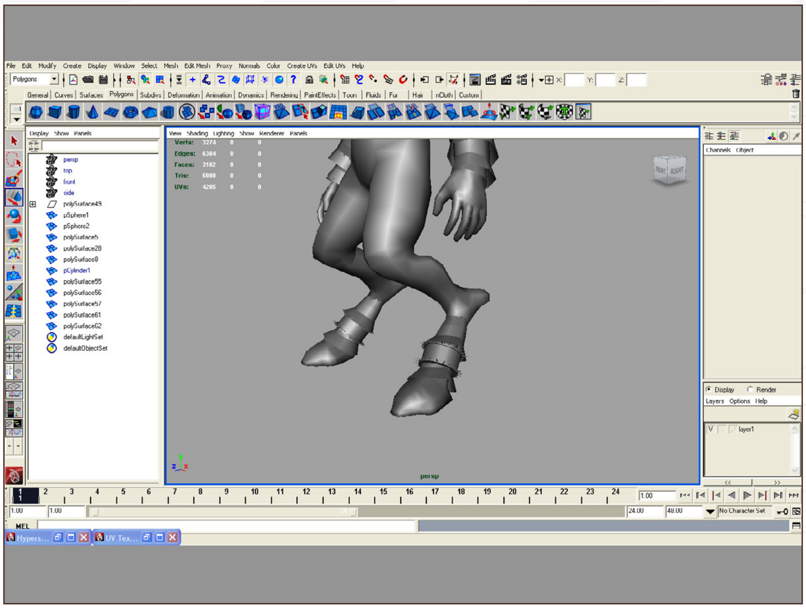


Fig 27

27. Duplicate this new model and scale it –1 in the X axis to mirror the new model onto the other side of the character. Like before, clear the history and Freeze / Reset the transformations of these objects (**Fig.27**).

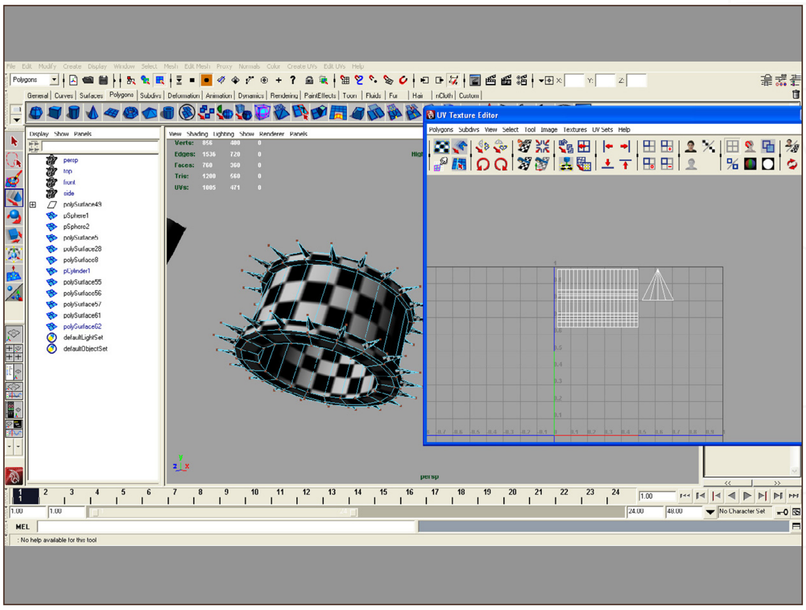
28. In a similar way, move to the lower legs of our character and, following the same steps as before, extract faces from the ankle area. Splay the ends of this new object out and add divisions along the mesh, conforming these plans closely to the character model. Duplicate this object and move the duplicate below the shackle. This will create the effect that the hair is being pressed in by the shackle and really help give it weight (**Fig.28**).

Fig 28



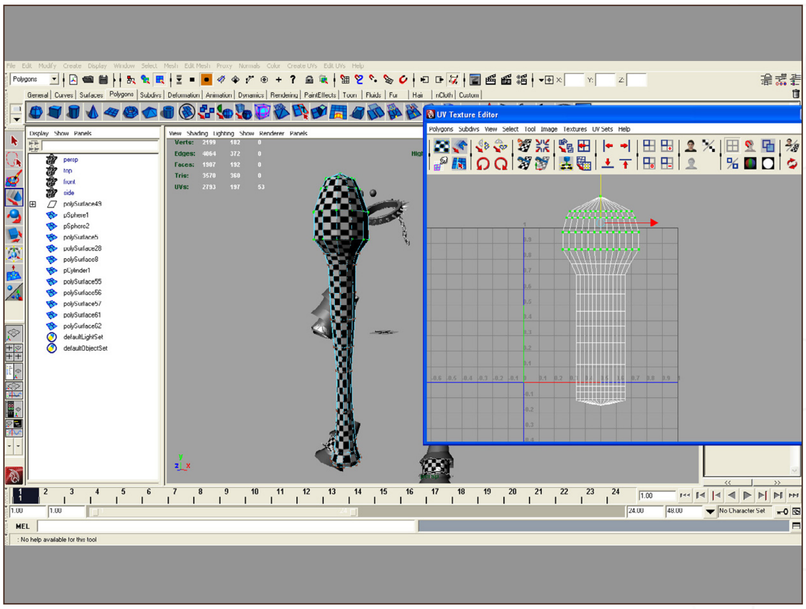
29. Since most of our objects were created from primitive objects that already have UVs, or were extractions from our mesh that had already been unwrapped, creating a UV wrap for these accessories shouldn't be too difficult. Starting with the ankle shackle, arrange the UV islands like in the image provided. A cylindrical map should already exist for this object. Make sure that there are no overlapping UVs and that the UVs are fairly well dispersed. Using steps in previous chapters, you can create a checkered material to help you visualize local stretching and texel density (**Fig.29**).

Fig 29



30. Moving onto the club, create a cylindrical map that encompasses the entire weapon. You can choose to have the top and bottom of the club as "caps" (separate islands that will leave a seam between the shaft and both ends) or choose for all of the top and bottom of the club to be stretched a small amount. Select the UVs that create the head of the weapon and scale them to resemble it's 3D counterpart (**Fig.30**).

Fig 30



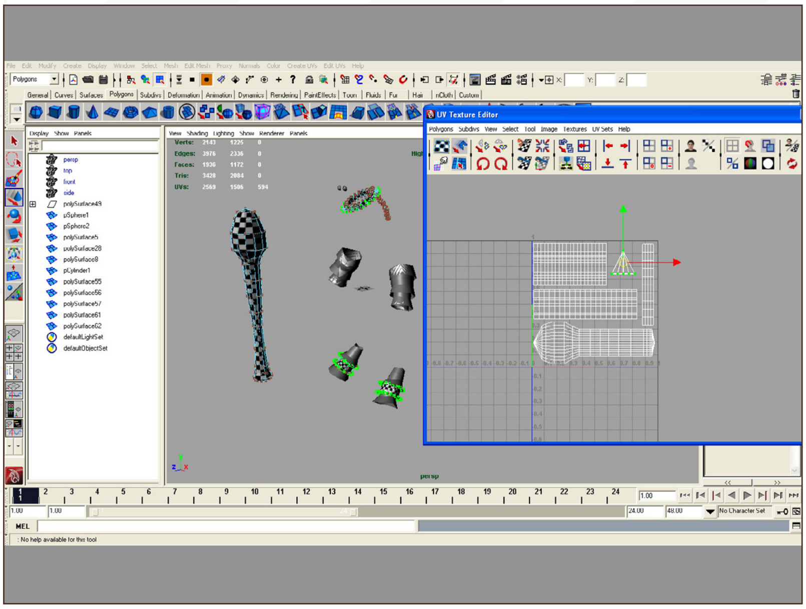


Fig 31

31. Follow the same steps for the collar that you did with the shackle and adjust the chain link UVs, which should already be intact, to reduce stretching. Ultimately, your UV layout for all of your accessories should resemble the image provided. Feel free to overlap all of the spikes as we will not be baking any information onto them (**Fig.31**).

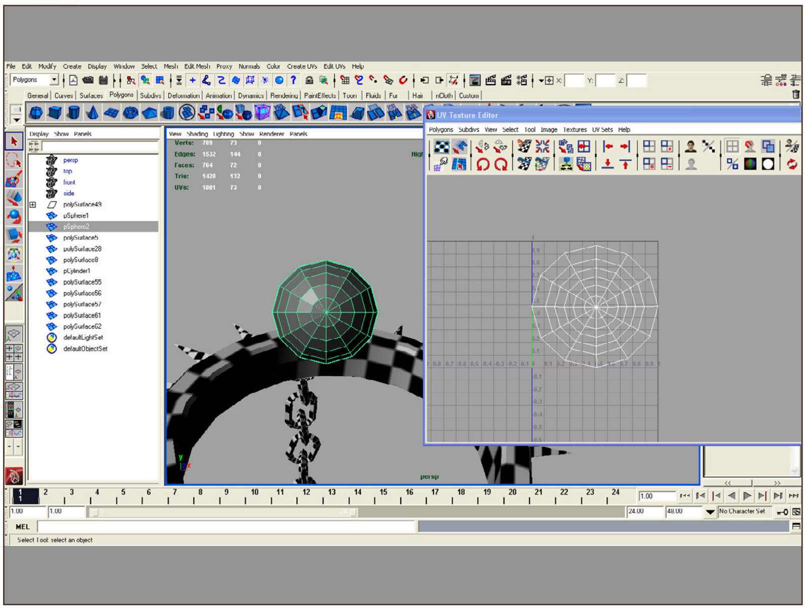


Fig 32

32. The eye will need new UVs as Maya's default sphere UVs do not lend themselves well to eyeball textures. Select the sphere and, with the "pupil" facing the camera, scroll to Create UVs > Create UVs Based on Camera. Select the outer edges and scale them out, loop after loop, to avoid any awkward distortion (**Fig.32**).

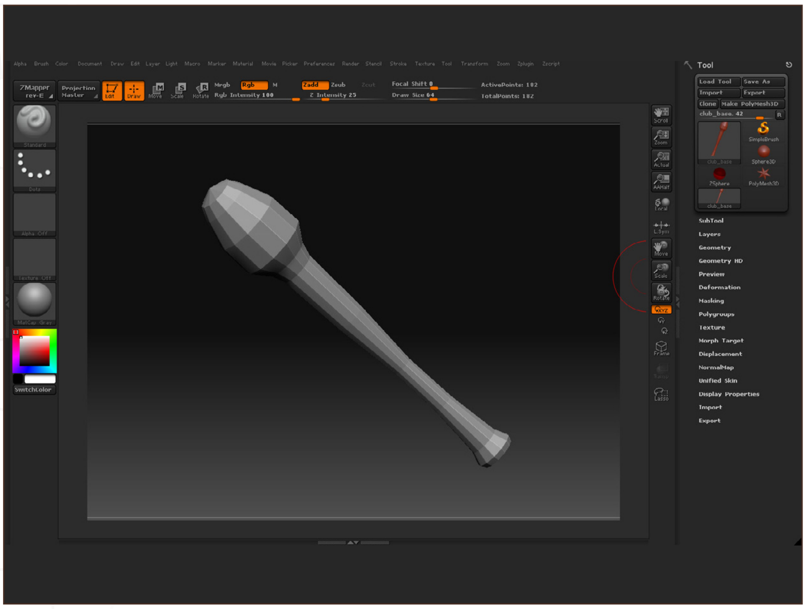
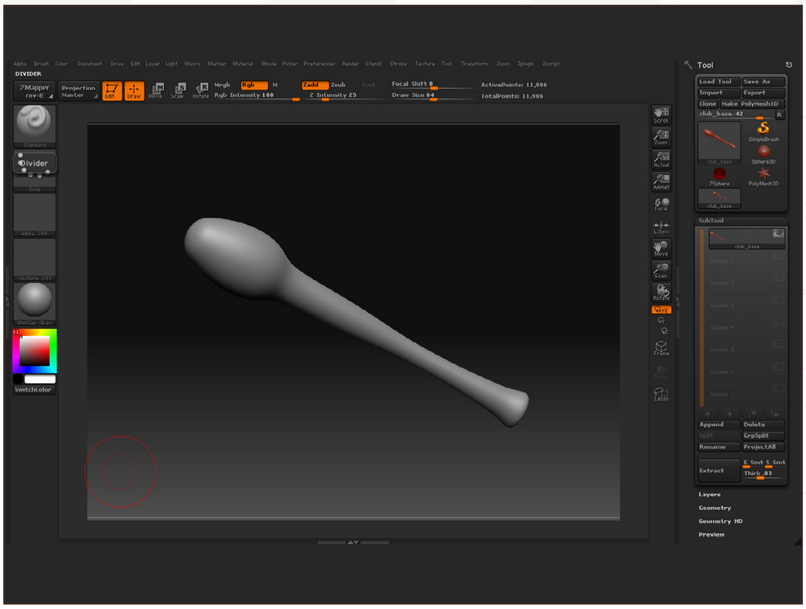


Fig 33

33. We should now take our weapon into ZBrush and create a high poly version for the normal map. Export the object as an OBJ in the same way as we have done before, and import it into ZBrush (**Fig.33**).

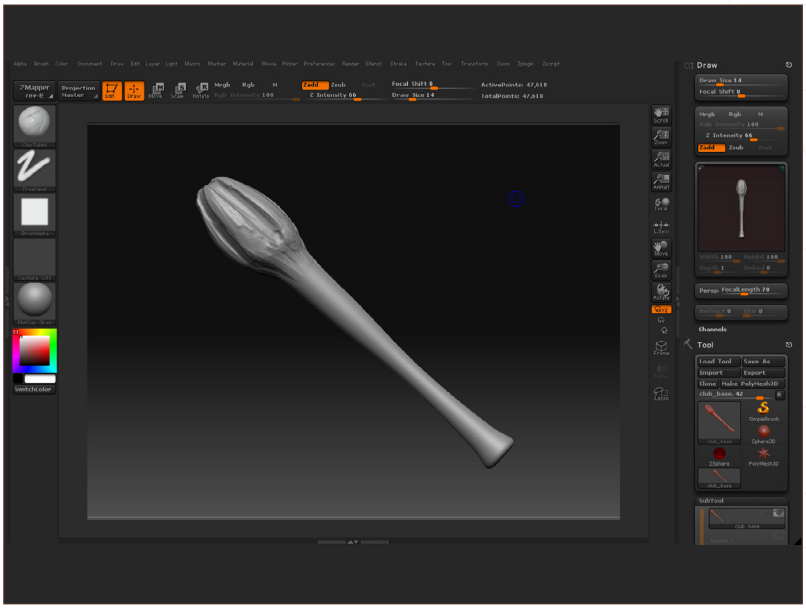
34. Duplicate the model a few times (CTRL+D) to provide more geometry for deformation (**Fig.34**).

Fig 34



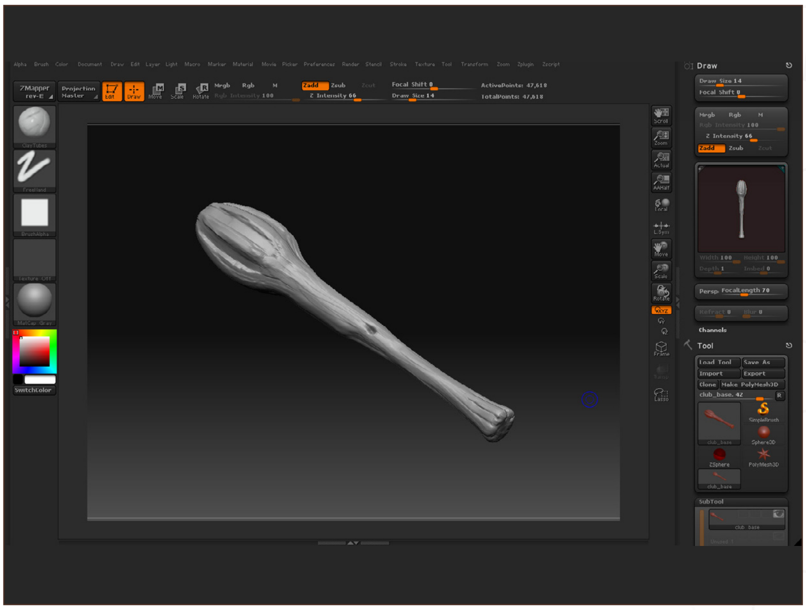
35. Using the Clay tools brush, form the head of the club. You can imagine how, with primitive tools made from rocks, slate and other items found lying around, carving anything beautiful from a big stick would be a challenge to say the least. At least our character has put in the effort! Give the head of the club rudimentary spikes (**Fig.35**).

Fig 35



36. Carve into the body of the club now, hollowing out some areas and adding a large indent where it's perhaps gotten caught or scratched (**Fig.36**).

Fig 36



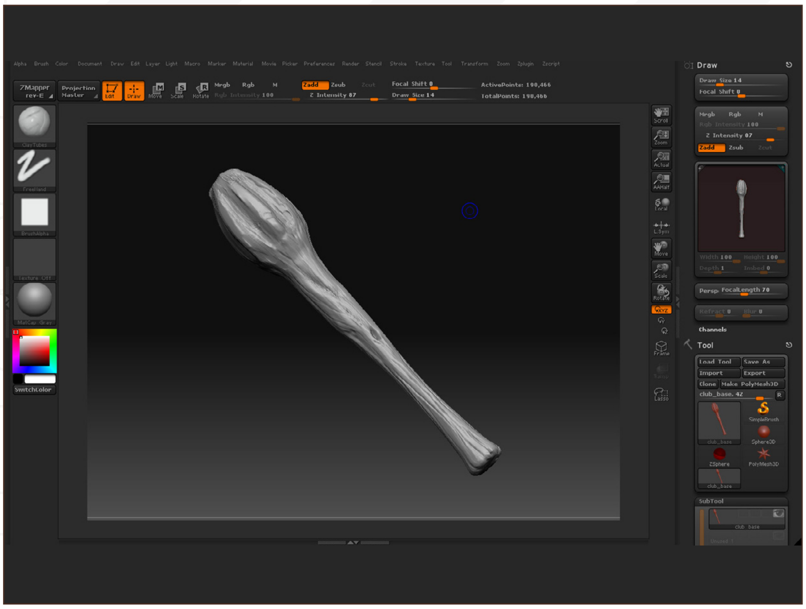


Fig 37

37. Alphas are very powerful in ZBrush for creating detail with brushes; they allow you to have more control over every brush stroke. Using the square alpha, I find that I can achieve a much more "chiseled" look in my sculpts, giving the effect of roughly rock, stone or, in this case, primitively carved wood (**Fig.37**).

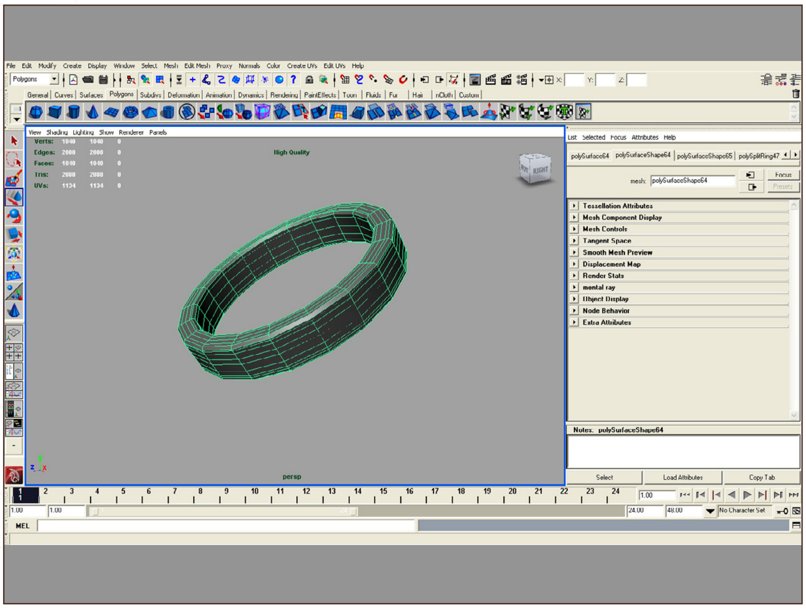


Fig 38

38. Going back to Maya, select the character's collar and duplicate it. This duplicate will serve as a base model for our sculpt. Remove all of the spikes and add a few supporting edges to help the model retain its shape once subdivided in ZBrush (**Fig.38**).

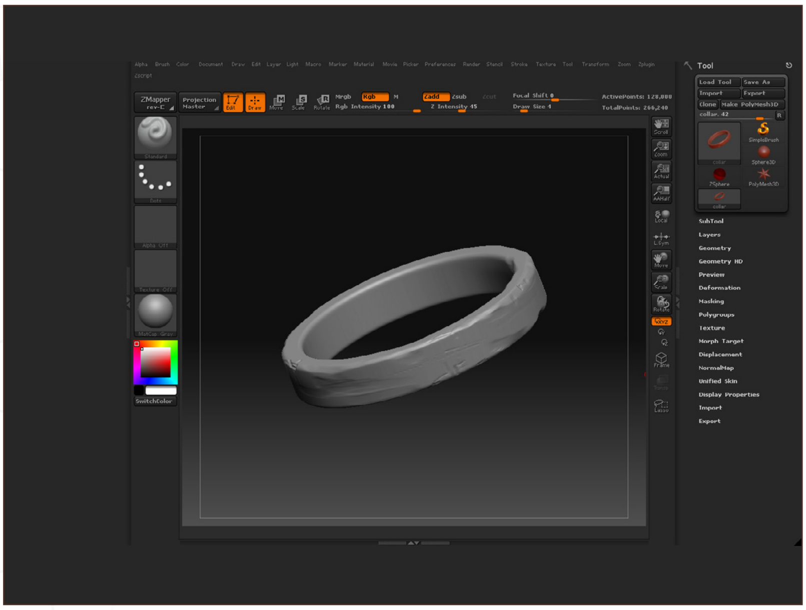


Fig 39

39. Import the collar into ZBrush and subdivide it a few times. Using the Clay and Mallet brushes, add scratches and damage marks to the collar model. Feel free to experiment with different alphas to achieve a damaged metal effect (**Fig.39**).

40. As in previous steps, load the high poly and low poly meshes into XNormal to bake AO and normal maps. Be sure to select "Average Normals" rather than "Exported Normals" to avoid hard edges all over your model. Once complete, your normal and AO maps should look something like this image (**Fig.40**).

41. Export a UVSnapshot. Import this into Photoshop to use as a guide. Select the areas of the UV Map that make up the chain link and collar / shackle spikes. Fill these areas with white in your AO Map. Replace all of the background colour in your normal map with the colour 125, 125, 255. I chose to replace all the black with this neutral blue colour (**Fig.41**).

Now we move on to texturing our accessories. There are a few reasons why I have segregated them onto their own texture map. Many game engines have different shaders for different materials and even different effects associated with material types. HL2, for example, shoots out different effects based on the material properties such as metal, flesh or wood.

You may also want to have different parameters for different materials. Metal, for example, will have different specularity and reflections than skin. Having different materials split up, or at least narrowed down to organics versus inorganics, makes that process much easier.

Also, I think it is a good idea to keep accessories separate from characters in general. With today's games it is not uncommon for a character to have access to multiple weapons. These weapons will be loaded as a separate asset and should probably have their own budget rather than being part of the character's original budget. Why waste character resources on a weapon that could just disappear after a few minutes of game play?

42. I began texturing the accessories by laying down a layer of base colours under the AO layer. Set the AO layer to Multiply, as we did before (**Fig.42**).

Fig 40

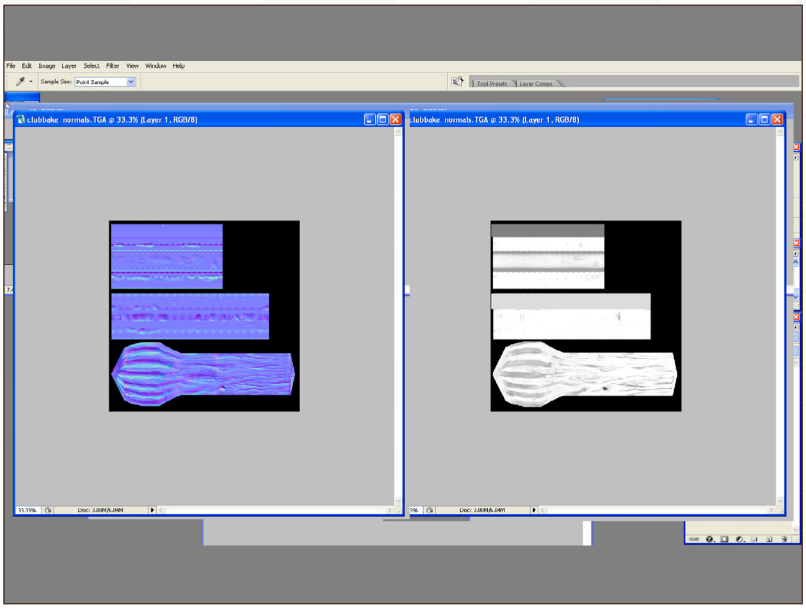


Fig 41

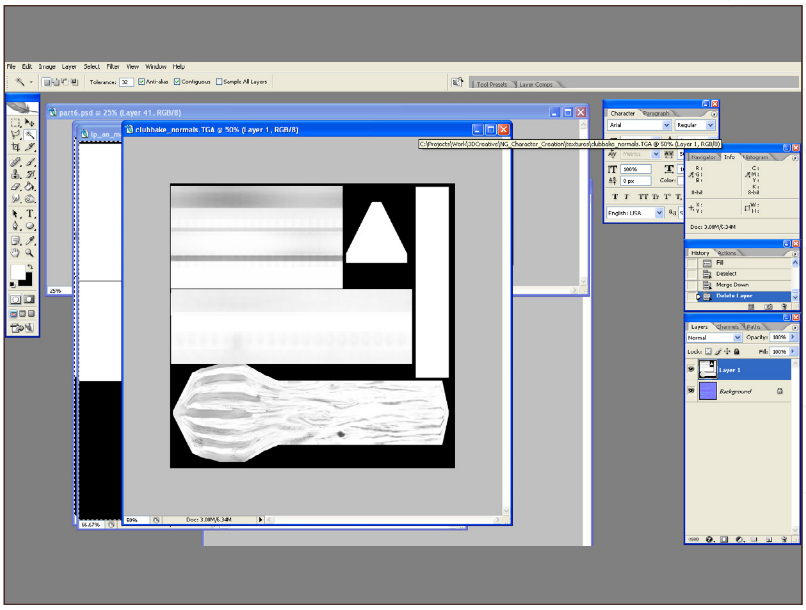
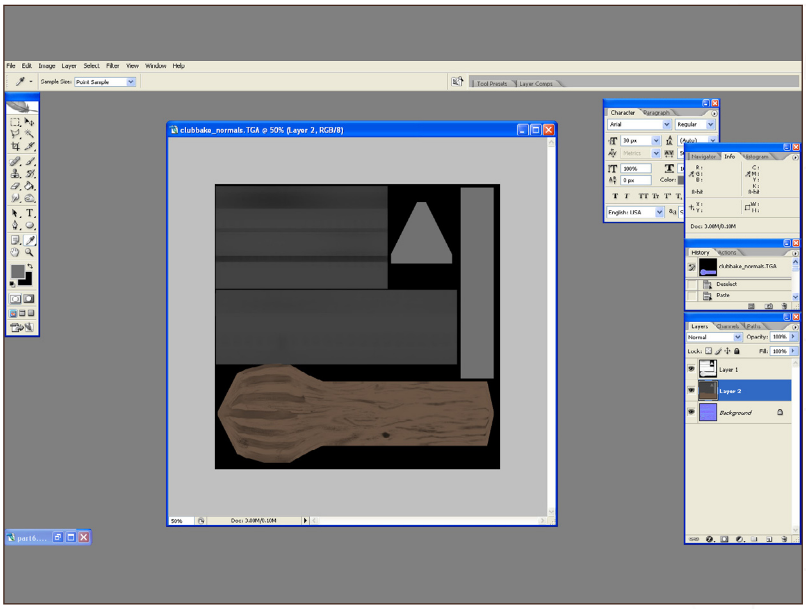


Fig 42



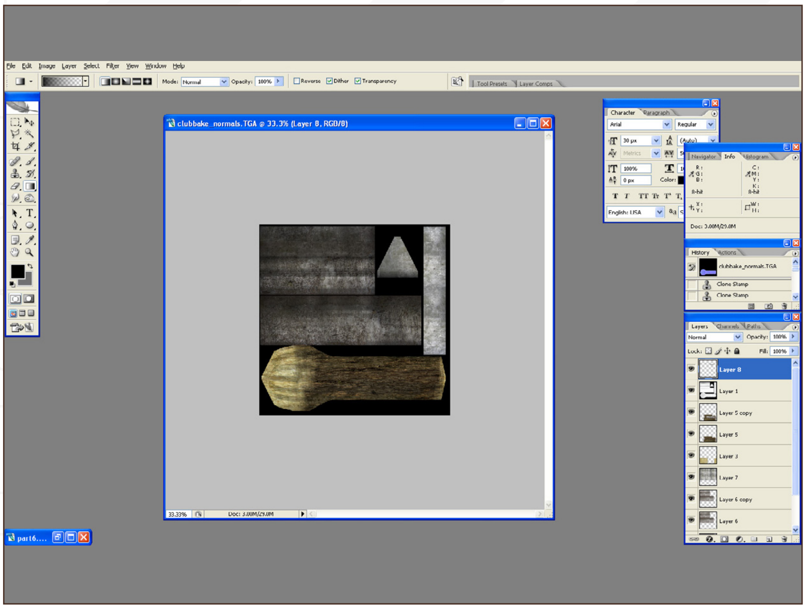


Fig 43

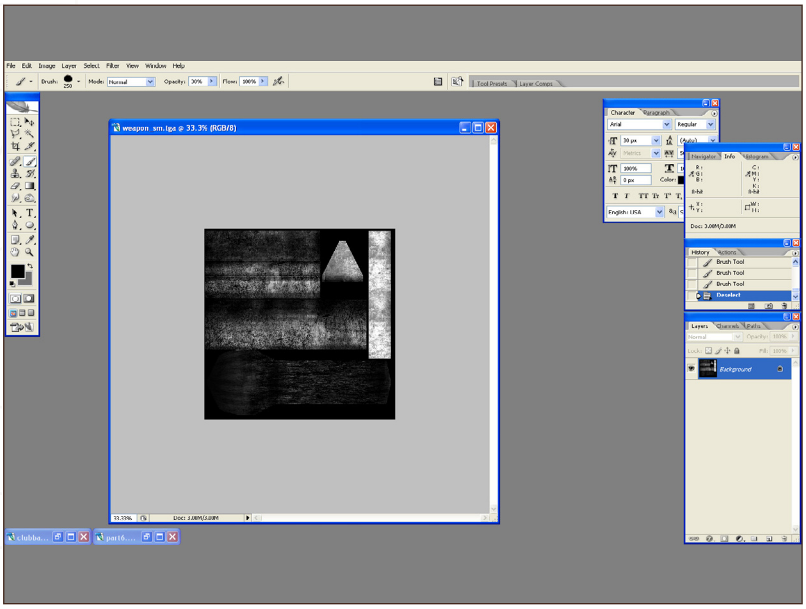


Fig 44

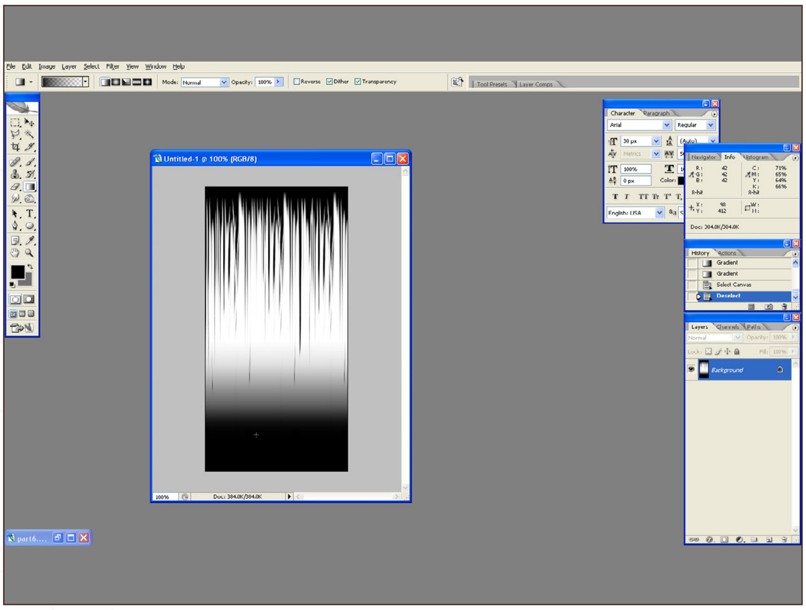


Fig 45

Our accessory textures are going to rely heavily on photo sourcing. Using a combination of photographs and hand painting underneath it, build up a texture that resembles a fallen branch – the top and base worn and with no bark or covering. Place a layer underneath your photographs and load in a new photo of a lighter wood. You can also opt to hand paint using a wooden color. In the original photo layer, apply a layer mask. With a white brush, paint carefully over sections of bark to mask them out, showing the wood underneath or simply erase areas you don't need. This is a good way to make it look like sections have been chipped or broken off, adding more interest to the texture.

43. Likewise, drop in some worn out metal textures onto the metallic parts. I have layered a few images of brushed and oily metal. A good thing to keep in mind is how the materials will be read. If the spikes and the collar are the same texture, it can be hard to pick out details. I've given the chains and spikes a slightly lighter metal, as they've probably been more exposed to scratching against other objects. This will help them to stand out from the collar (**Fig.43**).

44. Now we are going to create a spec map for our accessories. Save out the colour map; I sometimes run Filter > Sharpen > Unsharpen Mask to make the diffuse textures more crisp. Desaturate this texture and alter the brightness / contrast so that the wood is nearly all black and the metals have stronger highlights. Feel free to manually paint in scratches here that would not be in the textures, otherwise. For metals, people will often paint scratches into their diffuse texture but, unless this is intended to represent chipped away paint, you would rarely ever see a scratch in such full colour. It is usually most noticeable as a break in material surfacing, which the spec map controls (**Fig.44**).

Let's create a hair texture now in Photoshop.

45. The hair texture needs to comprise of a diffuse map and an alpha map, which being grayscale we can put in the alpha channel of

our diffuse texture to save loading two textures. Create a new document and make sure the background layer is pure white. A size of 512 pixels in height and 256 pixels in width allows us just enough room and resolution to create a good quality hair texture. We really don't need a square texture here as it would be a waste of space. Be sure to follow standard game resolutions (4, 8, 16, 32,64, 128, 256, 512, 1024, 2048, etc.) as numbers that fall in between tend to scale up to one of these recognizable sizes for rendering and can cause problems if your project has a tight budget and, generally, these resolutions have more or less become ingrained into game artists mind... so anything else can be awkward to work with.

Create a new layer above this and, using the hair brushes we created in the last part, paint a lock of hair. Try to keep this quite vertical, with a little variation here and there. We will be tiling this horizontally, so it's important that there is not, for example, one hair that is significantly longer than the rest. Fade the bottom into the white background by erasing softly (**Fig.45**).

46. Now let's create the diffuse color. This one is simple as we really just need color information and a little noise. Paint two shades of brown onto a new layer. The top of the map will be the tips of the hair and the bottom will be the roots (**Fig.46**).

47. Setting up materials in Maya is quick and easy.

Scroll to Window > Rendering Editors > Hypershade. Click on Blinn to create a Blinn material. This is a simple surface type that will give you access to Diffuse, Normal and Spec nodes. With your character model selected, right click over the new shader ball and select Assign To Selected. Since we will just be using this material in Maya, and it has no bearing on export or import into Marmoset, you can leave the name of the material or change it to whatever you would like for organization purposes (**Fig.47**).

Fig 46

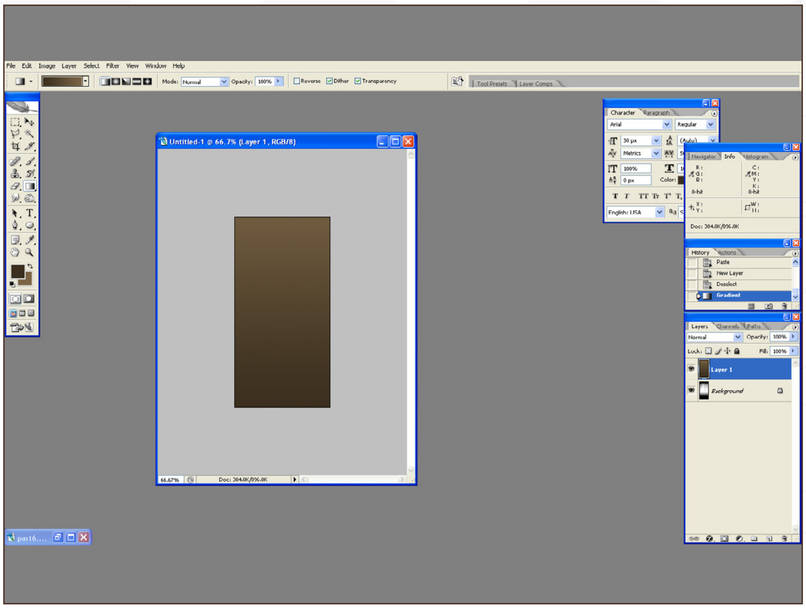


Fig 47

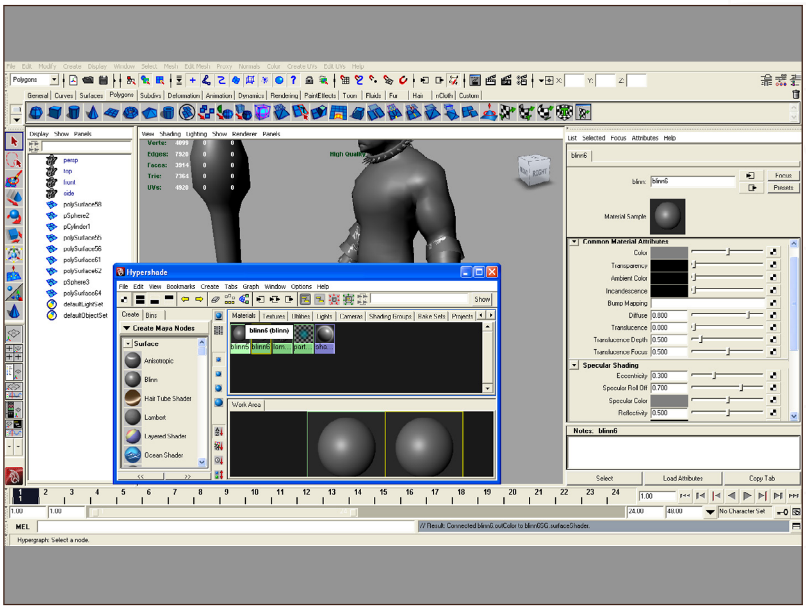
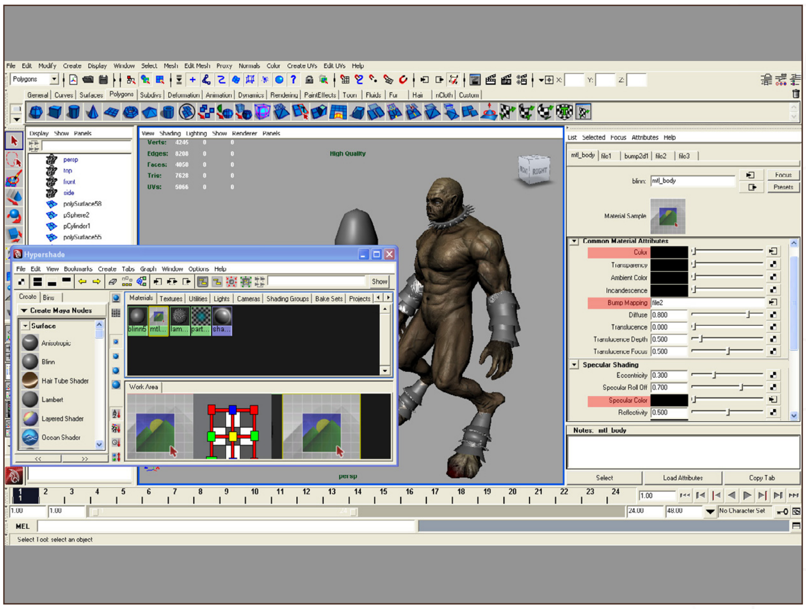


Fig 48



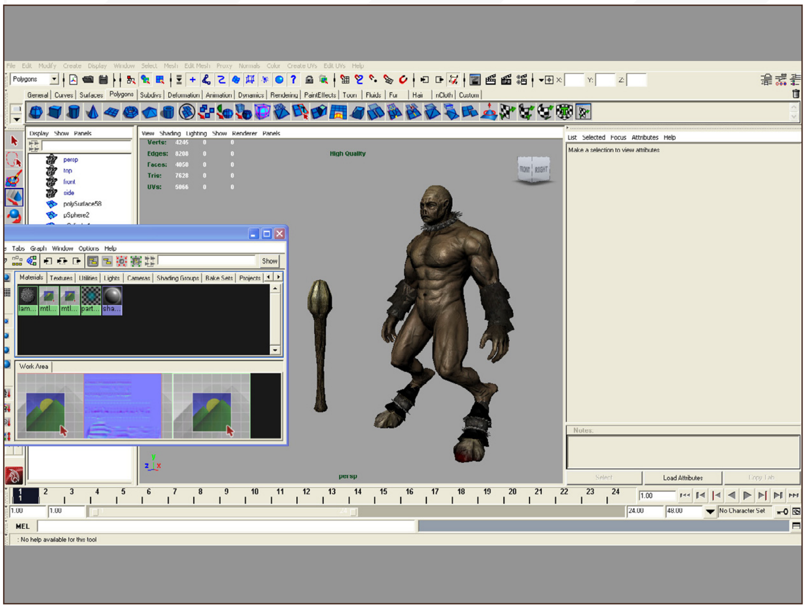


Fig 49

48. Now, under “Color”, “Bump Mapping” and “Specular Color”, click on the checker board icon to the right. For each one find the texture you created. If you are in High Quality rendering mode you should see all of the textures immediately (**Fig.48**).

49. Repeat this process for the accessories (**Fig.49**).

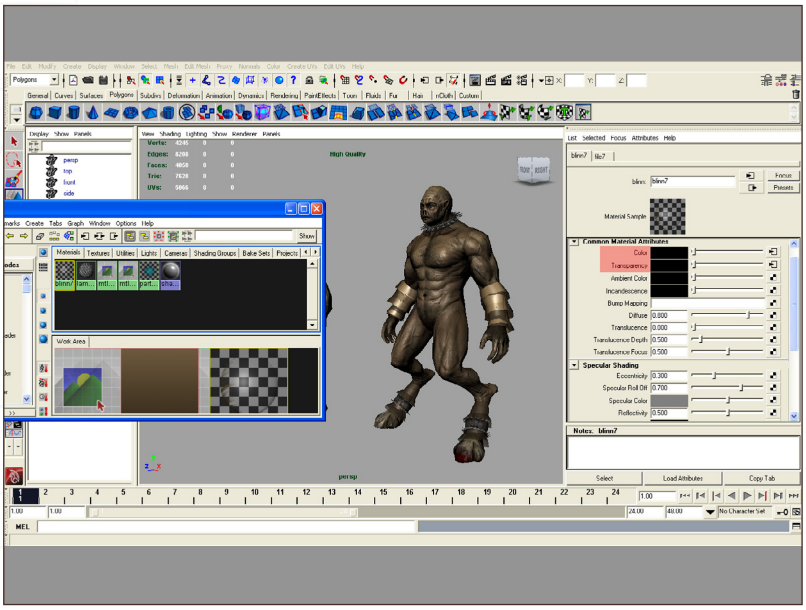


Fig 50

50. Likewise, create a material for the hair. You will notice that as soon as you load in the hair color map, the alpha map is automatically picked up in the “Transparency” slot, provided that you saved the hair texture with an alpha channel, as a 32 bit image (**Fig.50**).

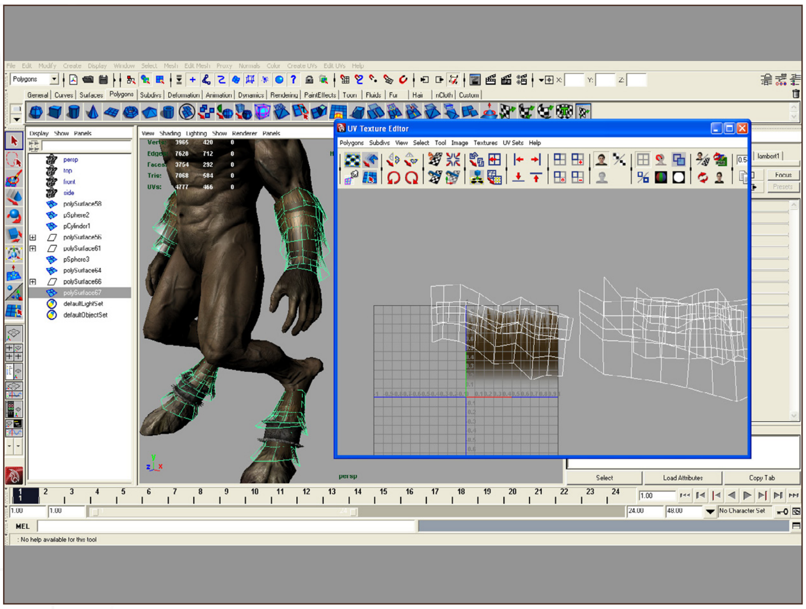


Fig 51

51. Arrange your UVs to run properly with the hair strands that you have created. Generally, you will not need to worry about stretching vertically; just make sure that the texture doesn’t stretch horizontally. Since we created a tiling texture, this shouldn’t be an issue (**Fig.51**).

52. Now we are going to view our model in a game editor's realtime viewer. I HIGHLY recommend this as your viewing method when it comes to realtime assets. The reason for this is that Maya has great rendering power, but different engines handle things differently and nothing is more frustrating than tweaking a model to look perfect in a 3D application only to have it fall apart once you get it in the game. Unless you have a technical artist to make you a set of shaders for Maya that greatly reflect that of, say, Unreal, HL2 or Marmoset... there will always be differences.

Marmoset is a nice, free model viewer and is available via the Marmoset Tool Bag from 8 Monkey Labs. Download it from here, http://www.8monkeylabs.com/archives/171, and feel free to tool around with it before moving on. The controls are fairly easy to get used to as they somewhat mimic Maya. A help doc is provided with the installer that covers FAQs and hotkey information.

Export all of your geometry as just one OBJ file. Be sure to name your objects and merge them together as needed. I had a model for my character model, the accessories all together, the eyes, and the hair planes. Make sure that the hair planes are the last model in the hierarchy by arranging it in the outliner to your left in Maya. The reason for this is that Marmoset will import these "chunks" of the OBJ file in that exact order. Since the hair will have transparency, it guarantees that the hair will be drawn last… after all of the character geo.

Fire up Marmoset, select Material Editor and the Open Mesh. Scroll to your character OBJ.

Select the default material and, under the materials tab, load the different textures you created in the appropriate slot, just like in Maya (**Fig.52**).

You'll notice that there are a few different options regarding shading methods for each material. You can set the character model's

Fig 52

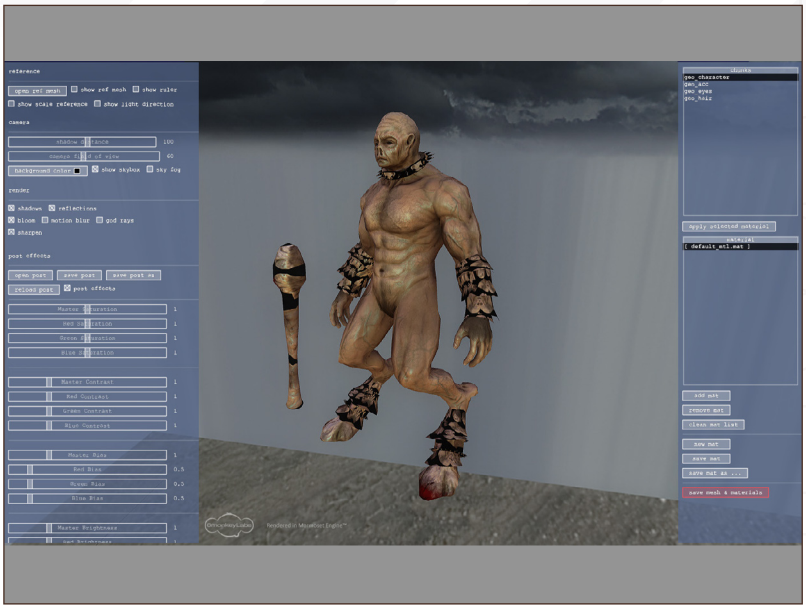
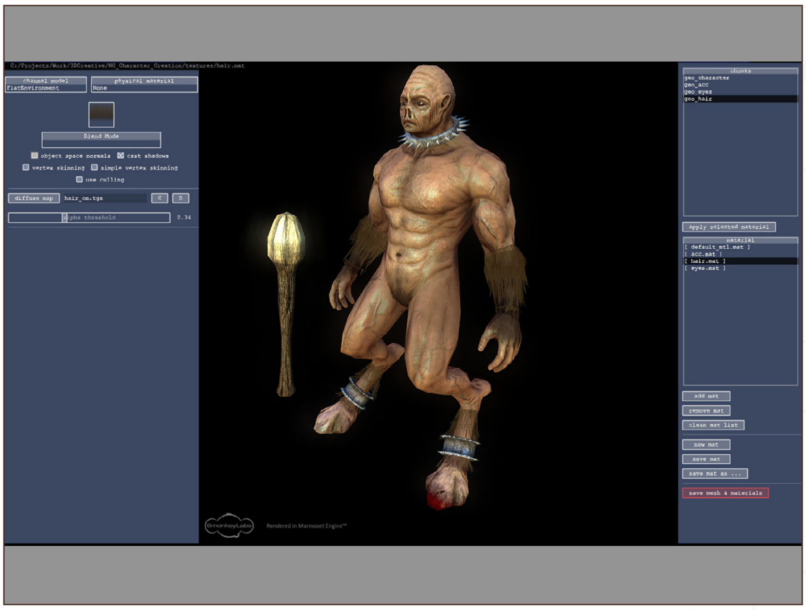


Fig 53

Fig 54



material to flesh, the channel mode to SkinEnvironment and Blending Mode to None. This will leave it as just a normal, solid piece of geo. I gave the spec colour a slight blue hue to compliment the yellow skin.

53. Follow these steps for the other objects. When you need to create a new material, simply click “Add New Mat” and, when prompted, enter a name to save it as. With the objects selected in Marmoset, you can also click “Apply Selected Materials” to change materials. Be sure to change the hair blending mode to Alpha and enable alpha test (**Fig.53**).

54. You can enable or disable skybox textures, and even load different ones in the sky tab for different lighting scenarios (**Fig.54**).

55. By going to the Render tab and clicking “Open Post,” you can scroll to the engine’s main directory where there is a “Post” folder that contains many different presets for post FX during render time. Feel free to play with different ones and to even try and create your own. Ultimately, I used a modified “Nextgen” setting (**Fig.55**).

56. To take a screenshot of the scene, first set the screenshot resolution by pressing the “~” key to bring up the console and typing in “set screenshotres #” with # being the biggest number that your video card can handle. Then press F10 to drop a screenshot of the scene into Marmoset’s root folder. I ran a few tests before finding a number that would work because if the number is too high, the video card won’t support it and will just spit out a black image (**Fig.56**).


Fig 55

Congratulations on creating your character up to this point! It’s been a long process and we have learnt a whole lot along the way. The games industry is very wide ranging and you might be expected to do all of these steps when building a character, unlike the film industry where you might be responsible for only one or two of these many steps. Creating textures, shaders, modeling and sculpting are all integral parts of a realtime artist’s job, and experience with and knowledge of the entire character creation process goes hand in hand with the skills necessary to becoming a great artist. I hope this tutorial has given you a good starting ground for now going off and bringing your own characters to life!


Fig 56

Creature Concept by: Richard Tilbury
Tutorial originally created by Joseph Harford in ZBrush & 3ds Max; translated by Gavin Goulden for Maya

Tutorial by:
GAVIN GOULDEN
For more from this artist visit:
http://www.gavimage.com
Or contact them:
gavin@gavimage.com

DOWNLOAD RESOURCES
- Free Low Poly Model & Textures

modo

NEXT GEN CHARACTER CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

Chapter 1 – Low Poly Modelling | Jul 09

Chapter 2 – High-Poly Modelling Part 1 | Aug 09

Chapter 3 – High-Poly Modelling Part 2 | Sep 09

Chapter 4 – Mapping / Unwrapping | Oct 09

Chapter 5 – Normal Mapping - Texturing | Nov 09

Chapter 6 – Material, Lighting & Rendering

The final installment in this series will discuss setting up a light rig, creating a shader for our character and show how to apply the numerous textures made in the previous chapter. The notion of body hair through the use of alpha maps will complete the character, before concluding with some additional accessories in the form of shackles, a chain and a wooden club.

DOWNLOAD RESOURCES

- Free Low Poly Model & Textures

Chapter 6 – Materials, Lighting & Rendering

Software Used: modo, ZBrush, Photoshop

Welcome to part six of this realtime character creation tutorial. We've learnt a lot throughout this series from low- and high-poly modeling and unwrapping, to normal map generation and, texturing, and a whole lot in-between. But our journey is not over yet. In this part we will go through setting up a light rig, and setting up our character with advanced shaders to help the textures simulated the various materials the character has. Finally we will create hair, eyes and a weapon for our character, using all the techniques learned in the previous parts to complete the character.

We will start off by creating a simple three-point light rig, which will light our character in an interesting way that will help to bring out its 3D form. Three-point light rigs have been widely used in the photographic industry for many years; they can fairly accurately depict our subject while helping him to remain visually appealing and flattering.

1. Open modo and load in your low poly character. Set the action center to Origin. Then adjust its original size or make the character about 7 feet or 2.1 meters tall. modo's lighting and rendering work best using "real world" sizes, so scaling the character to the proper height will help relate the camera and light settings to their real world equivalents (**Fig.01**).

2. Create a new sphere along the Y axis with 8 segments and 12 sides (**Fig.02**).

3. Delete the top half of the sphere and then flip the normals so they are pointing inward (**Fig.03**).

Fig 01

Fig 02

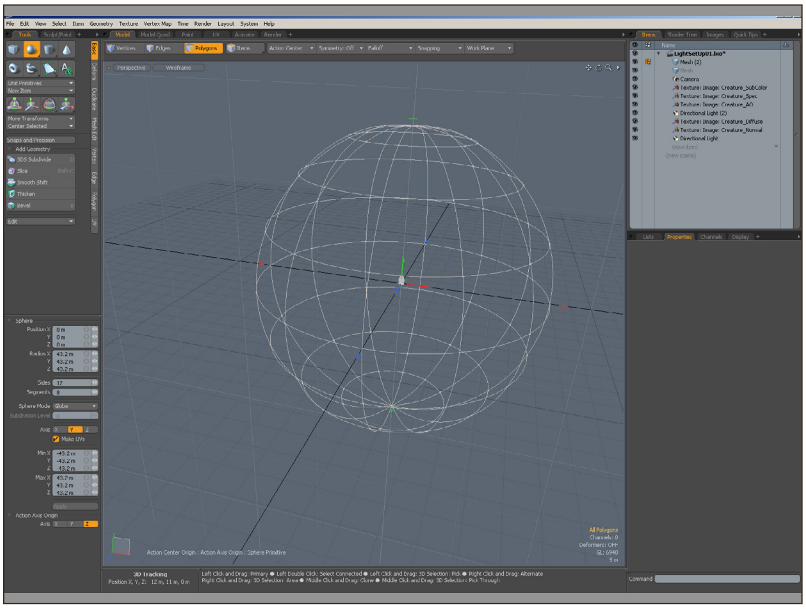
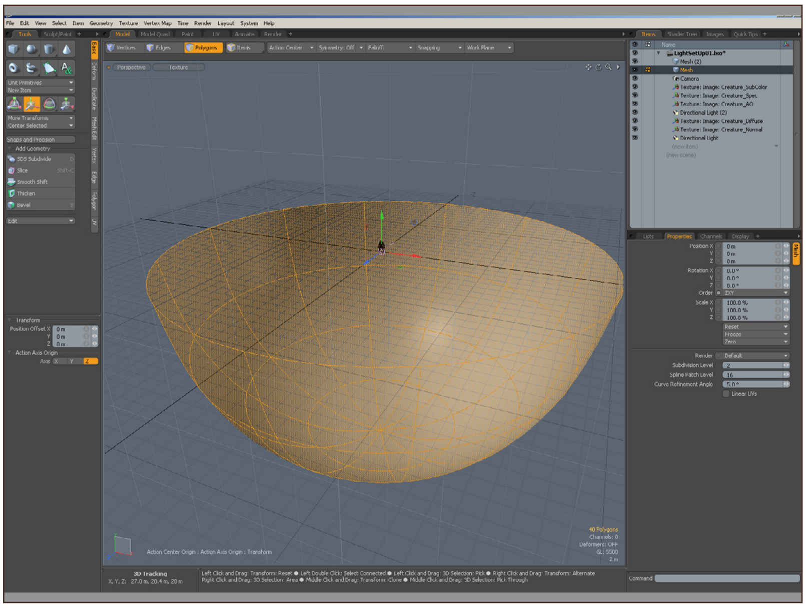
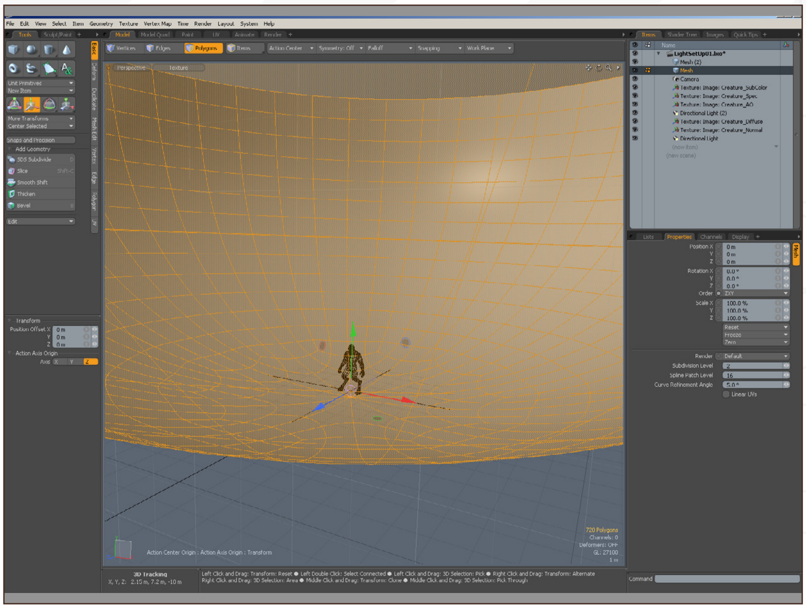


Fig 03



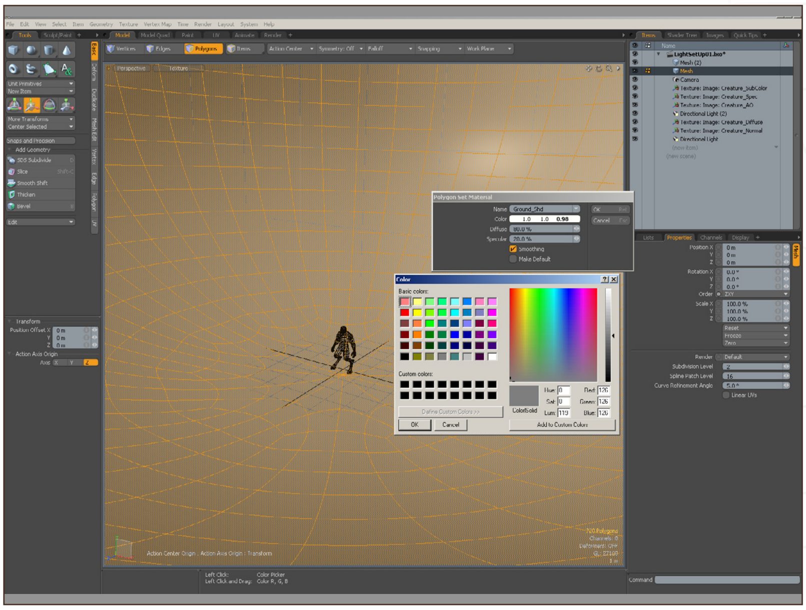
4. Uniformly scale the whole bowl shape up to fill the whole screen, then subdivide the sphere a couple of times so light shading will display in open GL reasonably well. Keep your character centered at the bottom of the bowl (**Fig.04**).

Fig 04



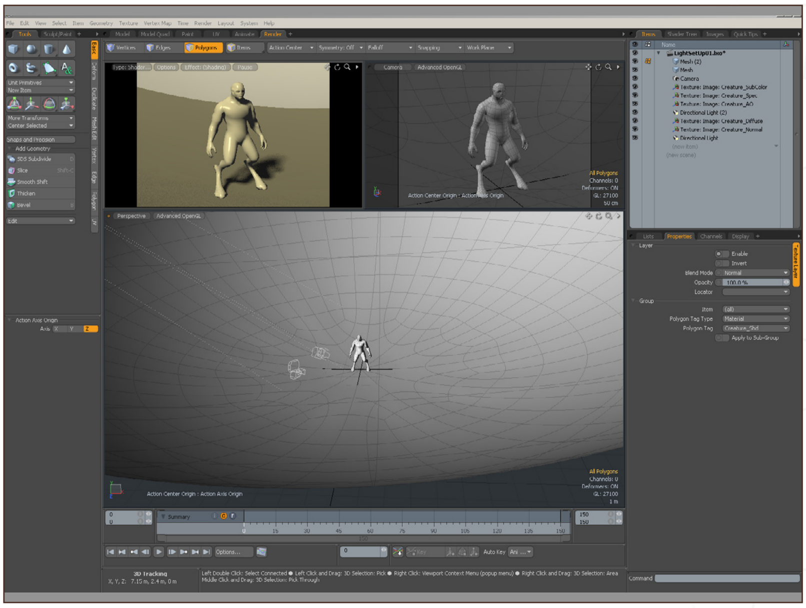
5. Press M and apply a medium grey material to the bowl shape. Name it "Ground_Mtr" and put the object into its own Layer called "Ground" (**Fig.05**).

Fig 05



6. Switch to the Render tab in modo and make sure the character is centered in the Render Camper window. As you make changes to the lighting and camera position, the Render view will automatically update (**Fig.06**).

Fig 06



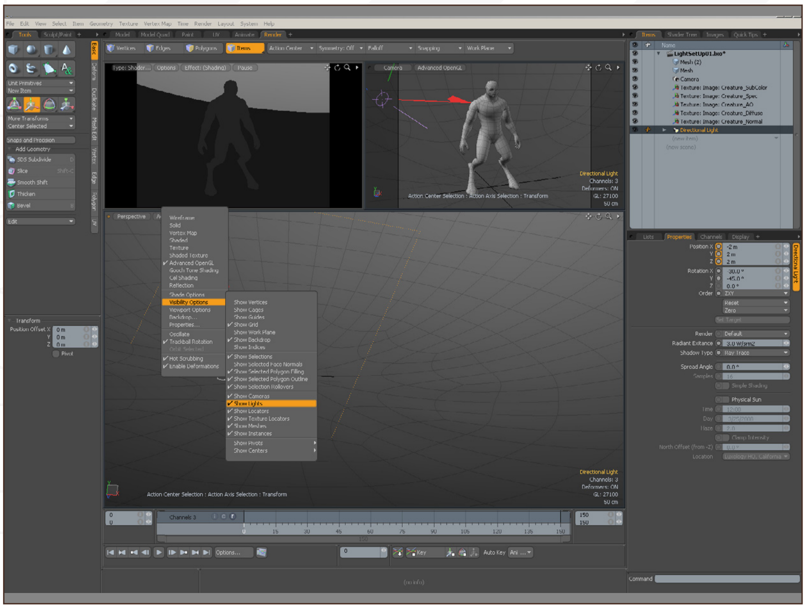


Fig 07

7. In the bottom Perspective window, turn on Advanced OpenGL – this will display the lights' area of affect. If you don't see anything, then make sure Under Advanced OpenGL > Visibility Options > Show Lights is active. Disable the Default "Directional Light" in the scene as we will not be using it at this time. You could delete it, but I find it helpful to have default light in a scene for easier mesh editing, rather than using the light rig (**Fig.07**).

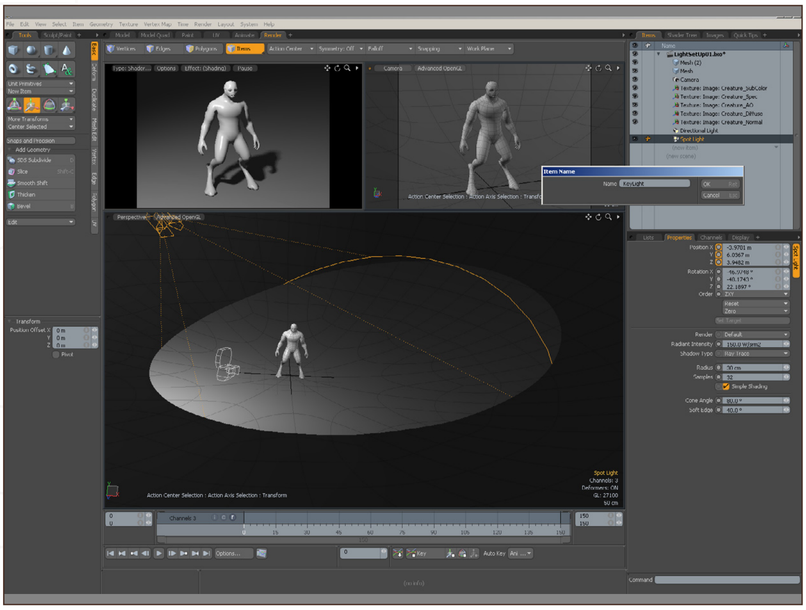


Fig 08

8. Go to menu bar: Item > Create Light > Spot Light. There are a bunch of different lights here that we could use, but for now "Spot Light" will work best for our needs as we can directly position our lights on our object, specify soft edge values, and cone angles. This will be our Key light so rename it as such in the item list. Select the spot light and drag the it out into the location shown. Set the Radiant Intensity to about 150, Radius to about 30cm and Samples to 32 to help soften the shadows the character casts. Adjust Cone Angle to about 80 degrees and Soft Edge to about 40 degrees. Shadow set the Radius to 1m (**Fig.08**).

Fig 09

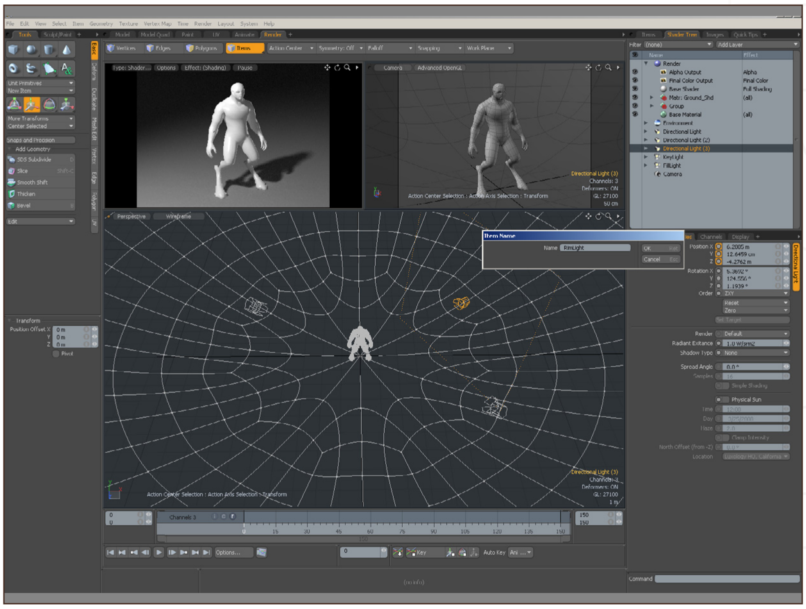
9. Duplicate the light by right clicking on the item in the list, then drag the copy over to orient it to point at the right side. Rename it "Fill Light" and then click Okay (**Fig.09**).

10. We can decrease the Radiant Intensity of the Fill light to something around 30 and also move the light down a little bit. Make sure to set Shadow Type to "None". The Fill light stops the unlit side of the object appearing too dark by throwing a little bit of light back into the scene and illuminating the darker areas. The Fill light can be tinted a certain color to produce certain effects. For example, in photography the Fill light might not actually be a light, it might be a large gold disk that throws a warm light back onto the subject (**Fig.10**).

Fig 10

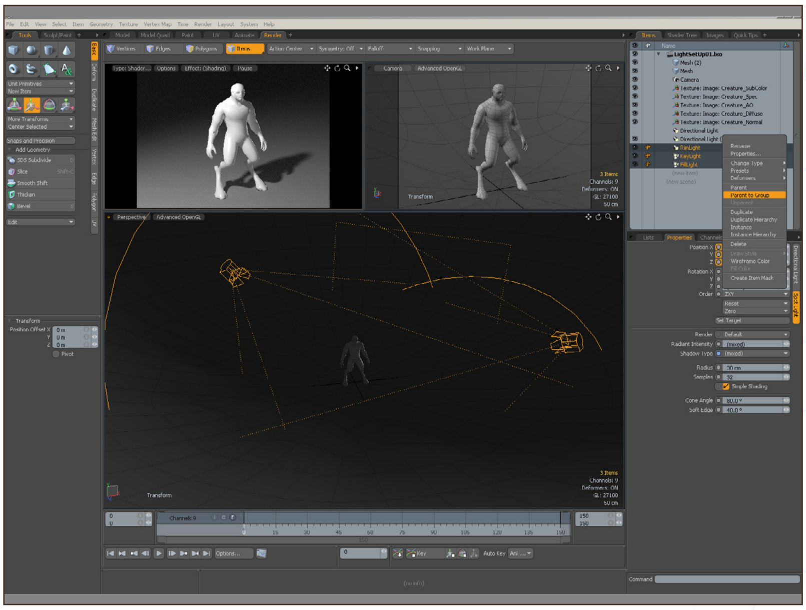
11. Finally, on the menu bar go to Item > Create Light > Directional Light. Orient the light to point towards the back of the object. Name this object "Rim light". We can use a Radiant Intensity on this light, something between one and two, as its main job is to stop the model fading into the background. Turn Shadow Type to None. It picks out the forms on some sides of the object and in certain cases can produce a halo-like effect. Drag this light down so it's almost directly behind the character and below the Ground plane, so it won't cast light upon the ground (**Fig.11**).

Fig 11



12. Now we can begin creating a simple texture setup after we organize our lights. So select all three lights and group them together, renaming the group as "LightRig" (**Fig.12**).

Fig 12



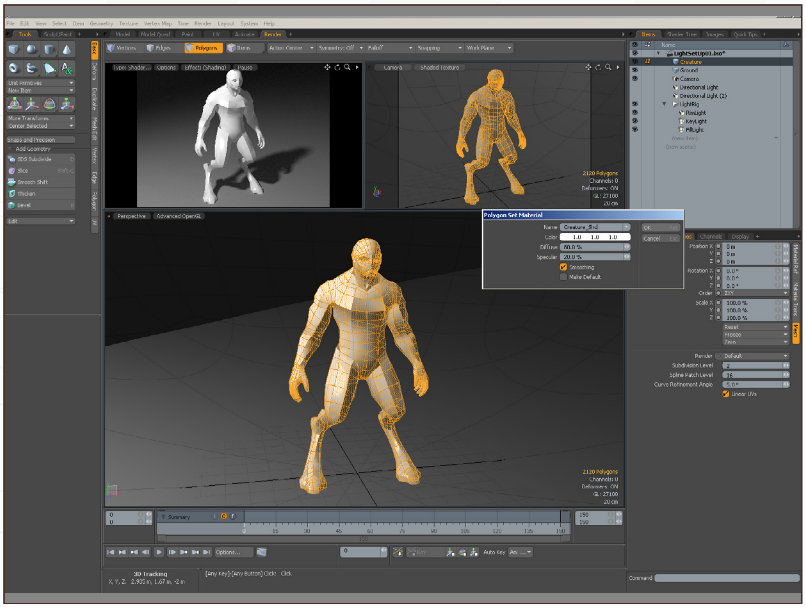


Fig 13

13. Select your character and press M on your keyboard. Name the new Shader "Creature_ Shd" (**Fig.13**).

Fig 14

14. modo can display up to three lights in Advanced OpenGL, so you might have to disable any extra lights to get your full light rig to work properly (**Fig.14**).

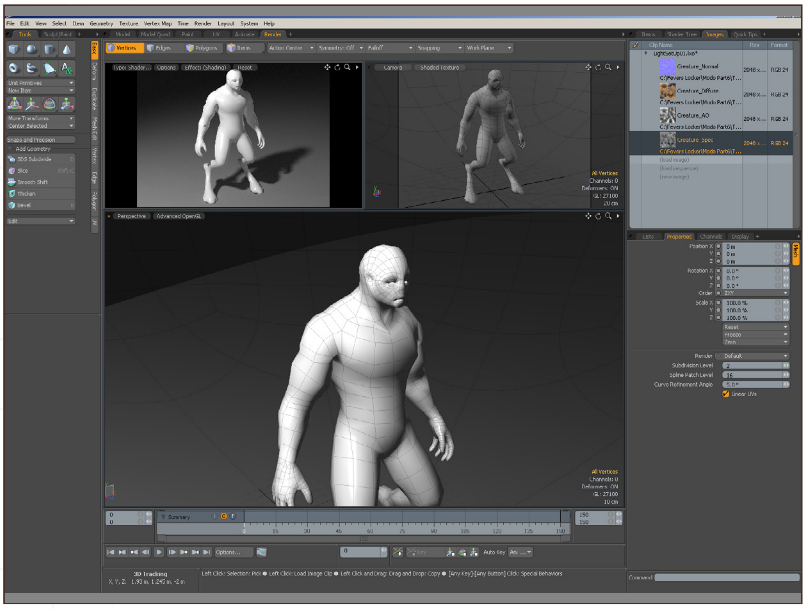


Fig 15

15. Let's load in our texture images so we can set up the model's skin and surface properties. The goal is to use the textures with various shader effects to simulate real-world materials such as skin, metal, fur etc.

Go to the Image tab on the top right and select Load Image. Load in all four of the maps you've created: Creature_AO, Creature_Diffuse, Creature_Normal and Creature_Spec (**Fig.15**).

16. Making sure the Creature Mesh layer is active, go back to the top Shader Tree tab, select the Matr: Creature_Shd group and expand. Click on the enclosed and under the Side Material Ref tab, change the Smoothing Angle to 180. Next use Add Layer to add an Image Map and select Creature Diffuse (**Fig.16**).

Fig 16

17. Assign the AO in the same way as Diffuse Color and then in the Texture Layer Properties tab, change its Blend Mode to Multiply. Make sure the AO layer is over the top of the Diffuse layer for the Multiply effect to work. This is very similar to how layers work in Photoshop (**Fig.17**).

Fig.17

18. Add another Image Map layer, assign the Normal image, and then change its effect to Normal. Your model should now appear with the High_Res detailing on the surface in the Advanced OpenGL view and well as in the render view (**Fig.18**).

Fig 18

Fig 19

19. Add the Creature_Spec image in the same way, but change its effect to Specular Amount. In its Texture Layer Properties, set the High and Low values so the surface has it spec broken up and removed from deep areas. I used a Low value of -25 and High Value of 35. This has the effect of decreasing the specular color down to a very dark gray, as otherwise it just looks overblown (**Fig.19**).

Fig 20

20. Next we will adjust the shader settings. Currently, modo does not support any advanced CGFX real-time shaders beyond what OpenGL provides. However by re-using our textures to control selected shader property effects, plus using shader settings that adjust the images' contrast, brightness etc, we can achieve a similar and realistic look with a software render. Let's start with Subsurface Scattering as that is one of the primary effects of skin. We need to lower the Diffuse Amount, tint the Specular color and adjust the Roughness. I used the settings shown in **Fig.20**.

Fig 21

21. Next, in the Material Transmission (Material Trans) settings, change Subsurface Amount, Subsurface Color and Scattering Distance to the settings shown in **Fig.21**.

22. The character is starting to look more fleshy, but too orange so we need to re-use the Diffuse Color Map to help control the Subsurface colors. Add another Image Map layer, then assign the Diffuse_Creature image, and change its effect to Subsurface Color. I then in increased the contrast and saturation with the High Value at 120% and Low Value at -20% to help enhance the existing surface colors. Finally I adjusted the Texture layer opacity to about 80% to slightly bring back the orange hue (**Fig.22**).

Fig 22

23. Sub Surface scattering can soften surface detail a bit, so I like to bump up the Normal Map strength about 20%. Select the Creature_Shd Material and change the Bump Strength from 100% to 120%. Be careful as this can cause rendering errors if overdone (**Fig.23**).

Fig 23

24. Since the character design suggests body fur, we will use a reflective Fresnel to help simulate the effect of light upon the surface as it turns away from the camera. Add another Image Map layer, assign the Creature_Diffuse image, and then change its Blend Mode to Soft Light and use a High Value of 300%. Next add a Gradient Layer and drag it onto the newly created Diffuse Color Layer to change the gradient into a Layer Mask, then adjust the input Parameter to Incidence Angle (**Fig.24**)

Fig 24

Fig 25

25. Next, click Edit Gradient and in the resulting pop-up window, under Value, put the first Key at Input 25%, Value 0% and a second Key at Input 100%, Value 100% (**Fig.25**).

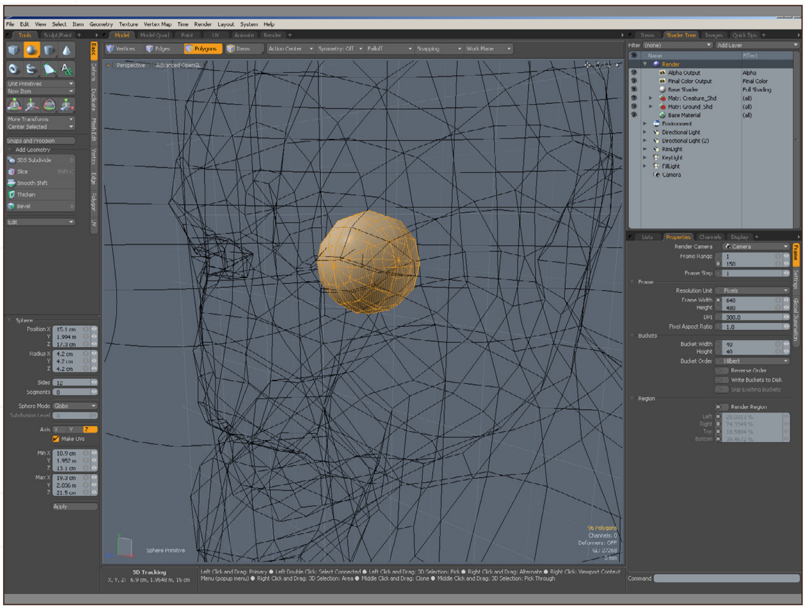


Fig 26

26. Congratulations on completing the body shader! Realtime game characters rely upon texture sets combined with general surface effects or tricks to visually simulate materials. Often, rather than using a different texture to control a shader and its effect, the same textures used for diffuse, specular, etc will be re-used with the shader, adjusting the contrast or intensity of the texture.

Normally it is best to complete all the various stages of modeling and texturing at the same time for better work flow and consistency. However that may not always be possible, maybe due to lack of good planning or last minute changes to the design, so here we are! Now we need to add the eyes and create a brand new shader to apply to them. In a new mesh layer, create a sphere with 12 sides and 8 segments along the Z axis and place it within the eye socket. In the original concept art, the eyes are sunken and not very visible, so we will make the sphere slightly smaller than usual and have them sunken into the socket (**Fig.26**).

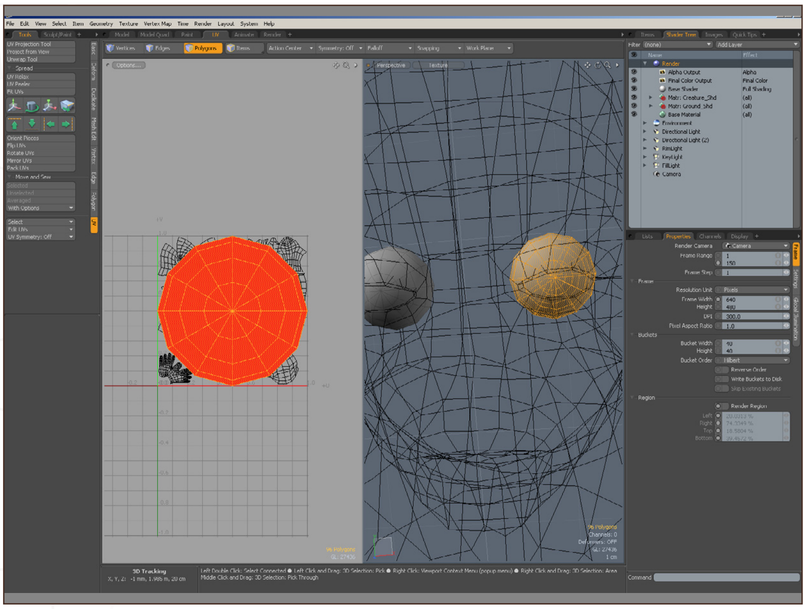


Fig 27

27. Next, with only the eye layer active, project the eye's UVs. Using the UV Projection Tool and a Projection Type as Planar along the Z axis, create some UVs for the eye that will work perfectly with our existing eye texture. Don't worry about the back of the eye as it will not be visible. Finally mirror the eye geometry over to the other eye socket and the eyes are ready for textures (**Fig.27**).

28. Using the same techniques as in the character body shader, go to the Image tab on the top right and select Load Image. Load in all three of the maps you've created: CreatureEye_AO, CreatureEye_Diffuse, and CreatureEye_Spec (**Fig.28**).

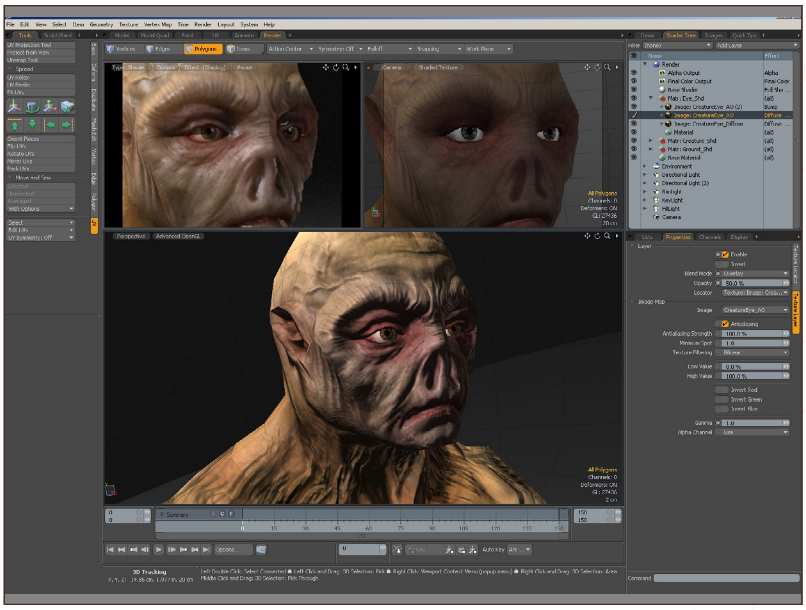
Fig 28

29. With the Eye Mesh layer active, apply a new shader called "Eye_Shd". Change Roughness to 20%, Reflection Amount to 5%, Reflection Type to Environment Only, and turn on Blurry Reflection. Next go to the Shader Tree tab, select the Matr: Eye_Shd group and expand. Click on the enclosed and under the Side Material Ref tab, change the Smoothing Angle to 180. Next use Add Layer to add an Image Map and select "CreatureEye_Diffuse" (**Fig.29**).

Fig 29

30. Assign the CreatureEye_AO as in step 17 and set the Opacity to 50%. Duplicate the AO Layer and change its effect to Bump (**Fig.30**).

Fig 30



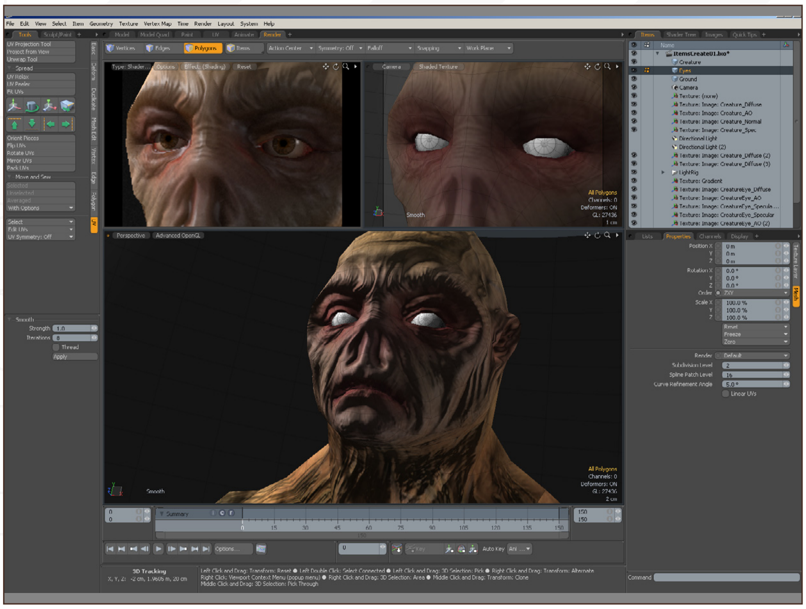


Fig 31

31. The eye will need a strong, small specular and reflection, so add the CreatureEye_Spec image in the same way, but change its effect to Specular Amount. Next, duplicate the Specular Amount Layer, change its effect to Reflection Amount and then reduce its High Value to 50% (**Fig.31**).

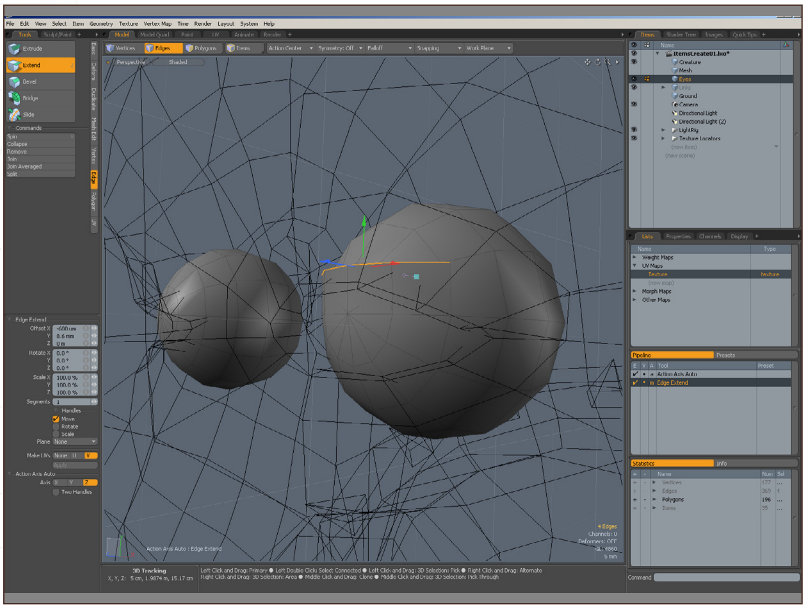


Fig 32a

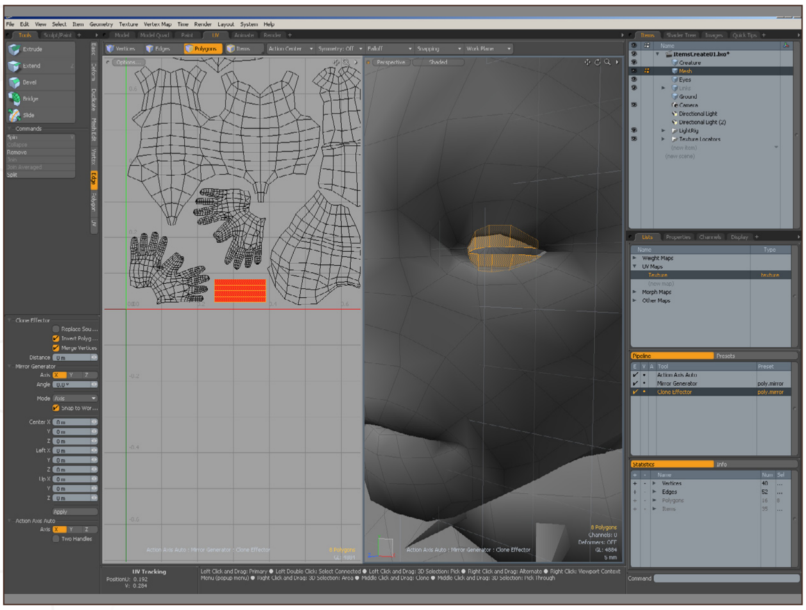
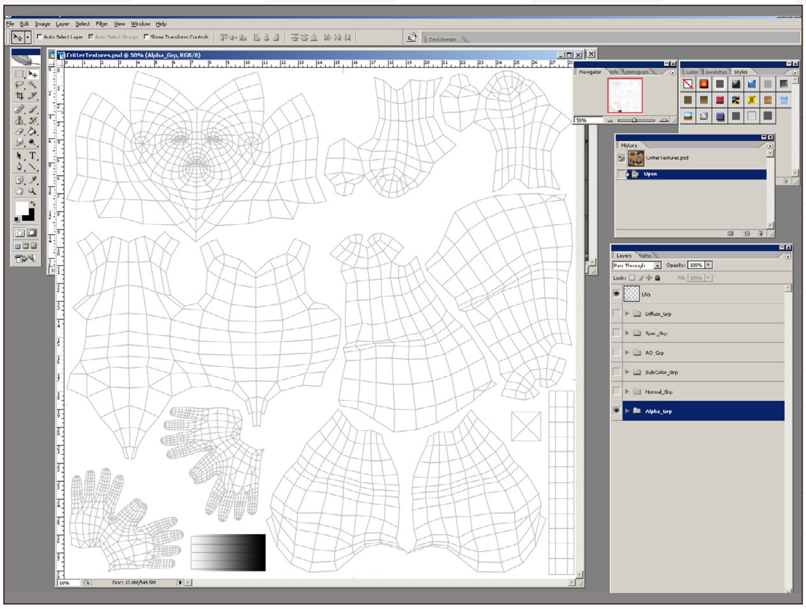


Fig 32b

32. They say eyes are the window to the soul. There is some truth in this in relation to our work. The eyes are what people first look at when they see a character's face, so they had better be high quality. Let's look at giving depth and realism to the eyes using a simple trick: I have created a cap over the eye socket, as close to the eye as possible, using a single polygon strip. Select the front few edges around the front of the eye pupil and go to Tools > Edge > Extend and drag out a new polygon row (**Fig.32a**). Cut and Paste the new polygons into a separate layer and unwrap the object with the upper section on the top, positioned out in a rectangle straight from on the UV map. Duplicate the polygons for the bottom of the eye as well (**Fig.32b**).

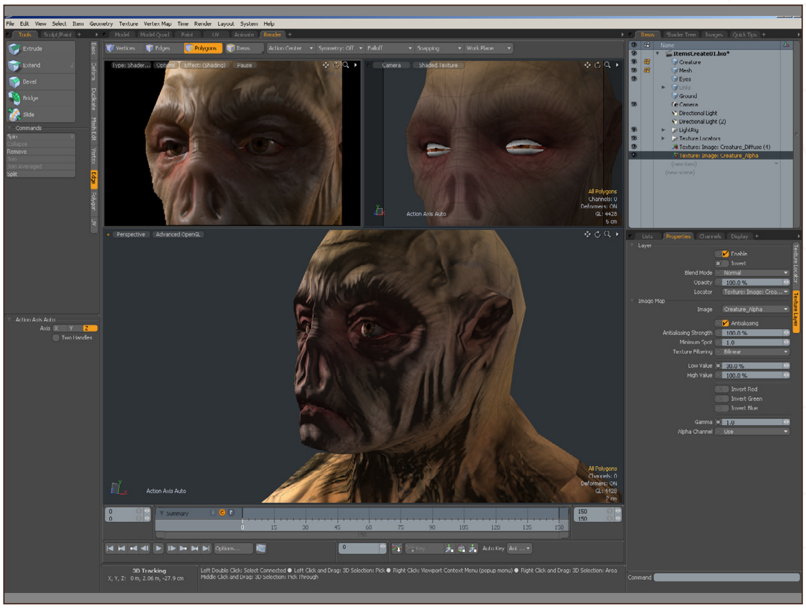
33. Create a new texture in Photoshop, which is essentially pure black. In the alpha channel fade the black into white near the top and bottom of the image, as shown in the screenshot. Save the image as "CreatureEyeShade_Diffuse" and "CreatureEyeShade_Alpha" (**Fig.33**).

Fig 33



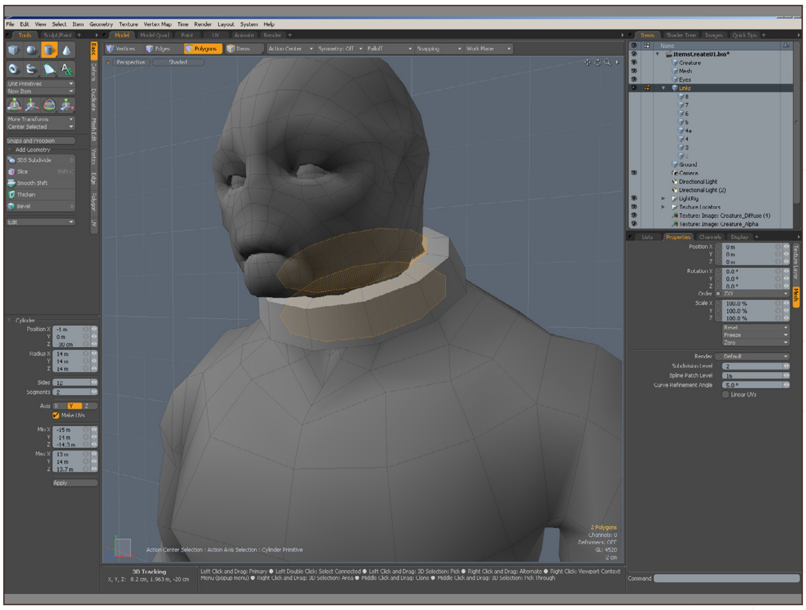
34. Create a new material for these polygons and apply the CreatureEyeshade image as a diffuse layer and CreatureEyeShade_Alpha as Transparent Amount. Apply this shader to the eye cap. You may need to flip the polygons of the eye cap if it does not show up immediately. I raised the Alpha low value to 30% to keep the eye shadow subtle (**Fig.34**).

Fig 34



35. In the concept art the character includes chains and shackles around his neck and his ankles, as well as a large club weapon. Starting with the shackles, create a cylinder with 12 sides and 1 segment and position it around the character's neck. Make sure it's slightly bigger than the neck to ensure it has thickness and the ring has a slight taper toward the top. Then select the top and bottom polygons, bevel them in by about 25mm and delete the center round polygon (**Fig.35**).

Fig 35



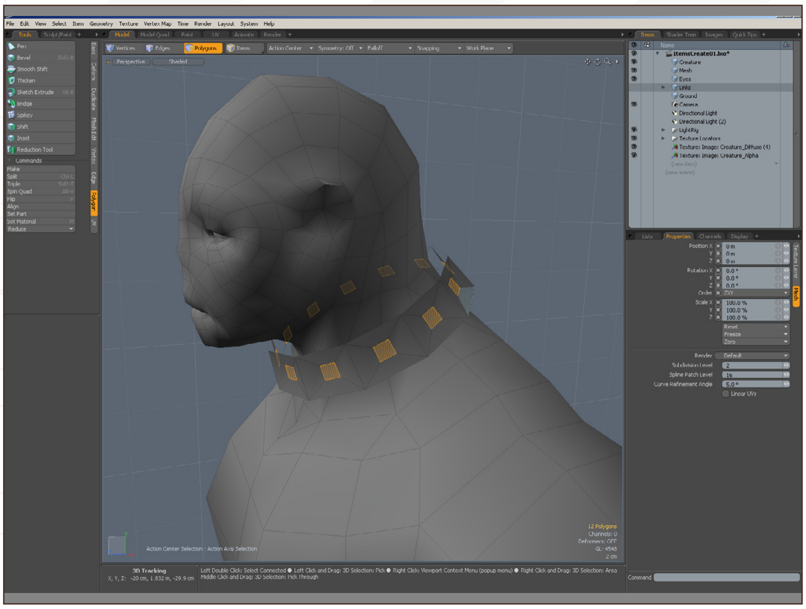


Fig 36

36. To make the spikes, loop-select the outer ring polygons, then copy and paste that ring into a new layer. Next bevel the polygons in about 18mm, with the Group Polygons option turned off. Keep the beveled inner faces and delete the rest (**Fig.36**).

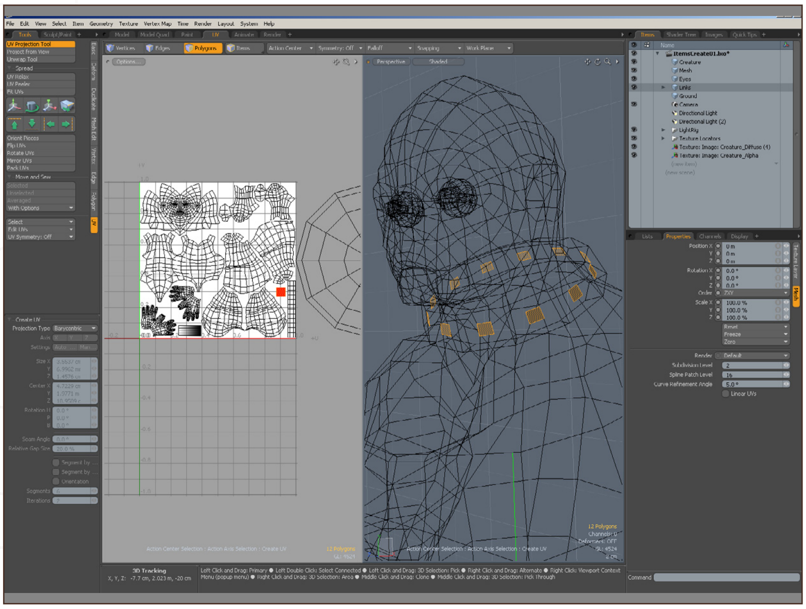


Fig 37

37. To keep our textures optimal, we will re-use the same texture for all the spikes. With all the inner faces selected go to Tools > UV > UVProjection Tool and set the Projection Type to Barycentric. This will automatically and evenly lay out all the UVs into an overlapping square that can then be scaled and positioned into an empty spot in the UV map (**Fig.37**).

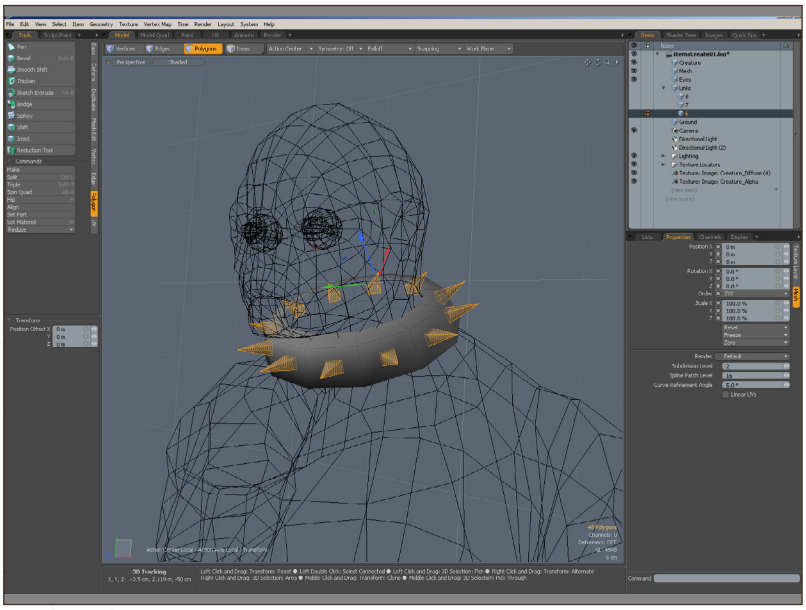
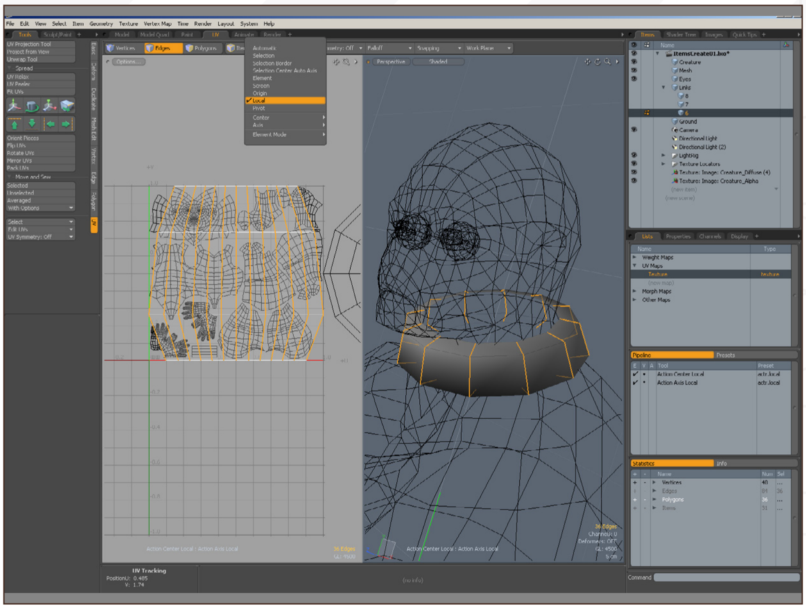


Fig 38

38. Next Go to Tools > Polygon > Spikey, with a Spike Strength of about 2.5 to finish the spikes. Now all the spikes are ready and their UVs are complete too (**Fig.38**)!

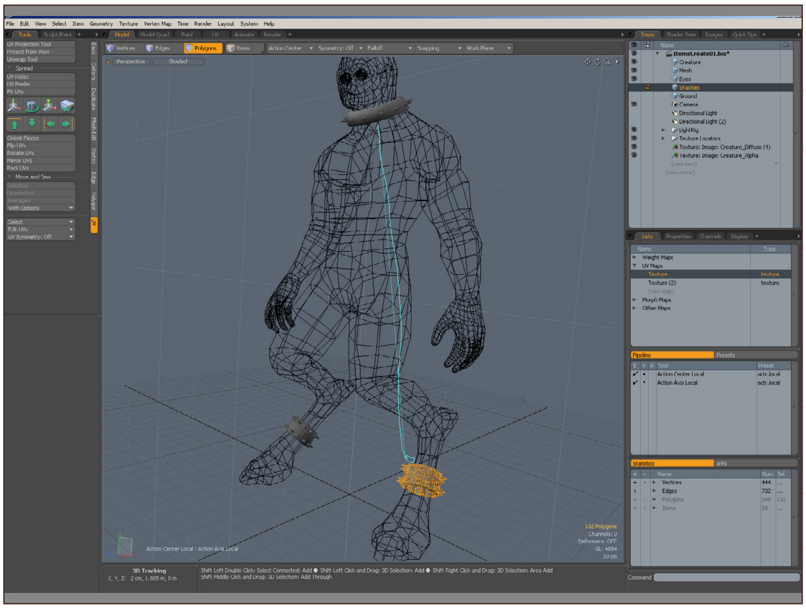
39. modo has many very powerful UV editing tools and in this step we will use a function that is unique to modo, and that I find to be one of its most powerful UV editing functions. We will re-use the neck ring and spike for the ankle rings, but first let's unwrap and position the ring's UVs – this way we can re-use the same texture and UV locations for all the rings as well. With one back edge selected go to Tools > UV > UV Peeler, set Uniformity to 0% and click apply. Change your Action Center to Local with an axis set to Auto, then select only the vertical edges and scale them all along U to 0%. This will align all the edges to each other. Next set your Action Center to Selection and scale and move the UVs to better represent the 3D geometry (**Fig.39**).

Fig 39



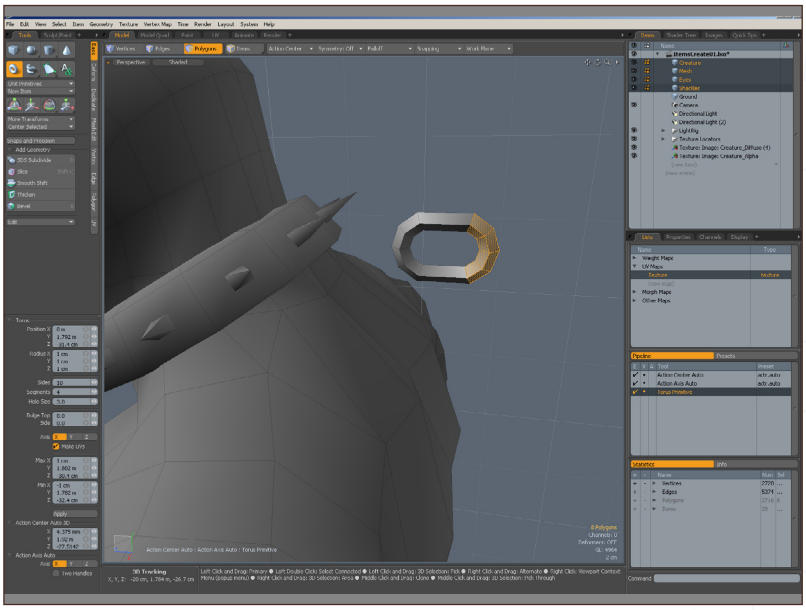
40. Copy the ring and spikes and paste them into a new layer. Using the concept as reference, move and scale the shackle into position on the ankle. Duplicate the spike row and position both as shown, then mirror the finished shackle over (**Fig.40**).

Fig 40



41. Now create a new Mesh Layer to be used for the chain links. We can use a Torus primitive with Radius of 1cm XYZ, 10 sides, 4 segments and a hole size of 3 with MakeUVs active. Convert it to polygons and move out one end of the loop to form an oval (**Fig.41**).

Fig 41



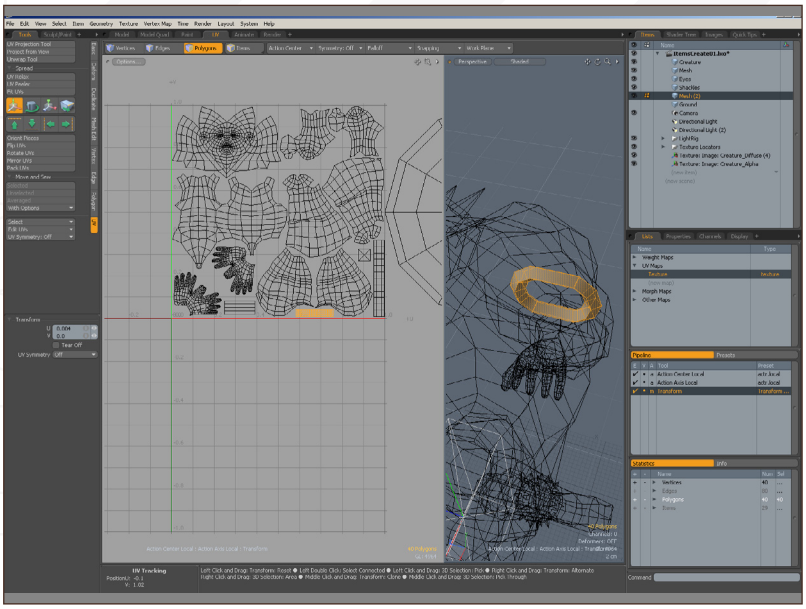


Fig 42

42. Before moving and duplicating the link, move and scale its UVs into a position on the UV map, as just like the spike we will re-use the same texture for each link (**Fig.42**).

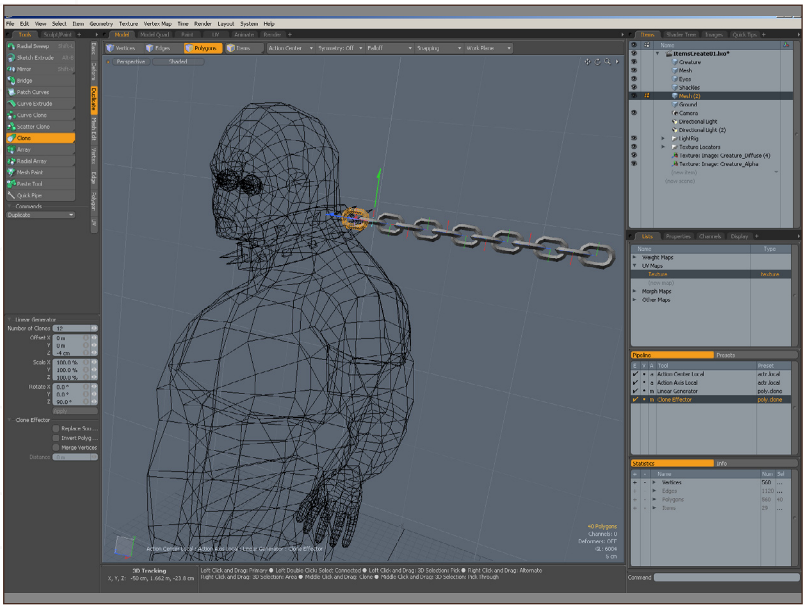


Fig 43

43. Position a link along the Z axis at the back of the neck shackle and right leg shackle, halfway embedded into the ring as we will use links as the chain base as well. Next, with the link selected, go to Tools > Duplicate > Clone. Set duplicate to 12 clones, -4cm offset, and 90 degrees rotate on the Z axis to instantly create a linked chain (**Fig.43**).

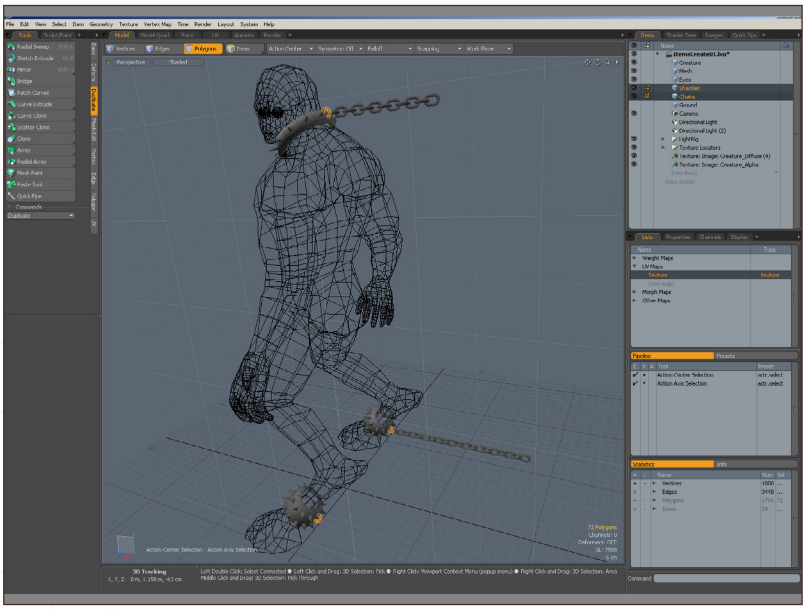
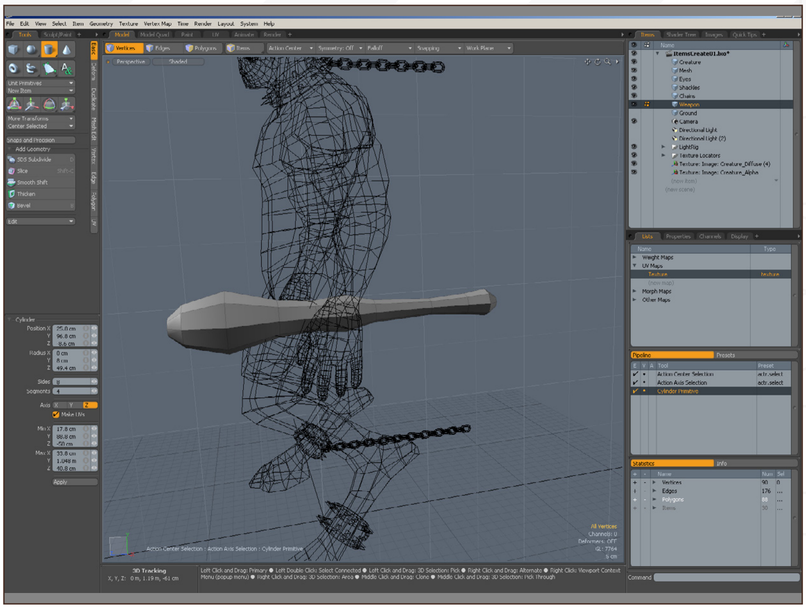


Fig 44

44. Finally rotate, scale and align the base chain link to each of the shackles to form the chain anchor. Then delete any inner polygons that are hidden within the shackle. It is best to pose the chain after the character model is complete, as when characters are rigged for animation this type of accessory is best left sticking away from the body (**Fig.44**).

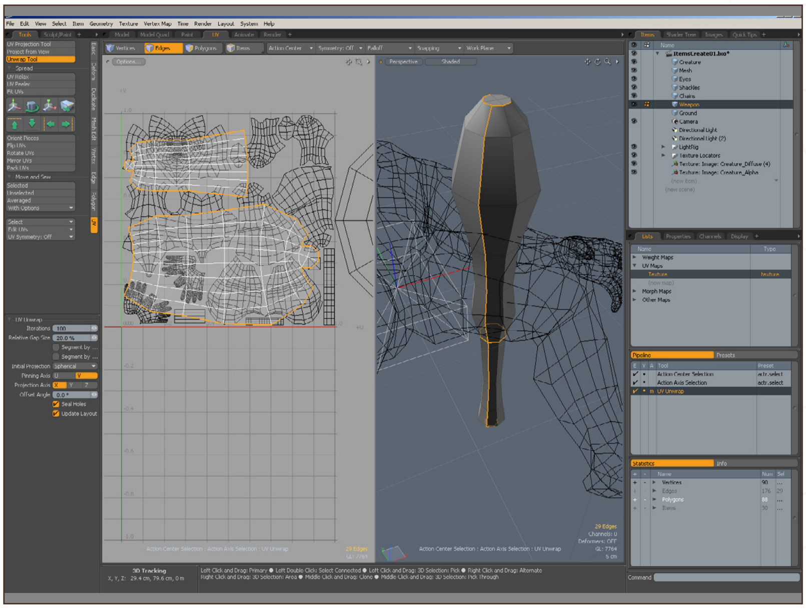
45. Next it's time to create the weapon. In a separate mesh layer start with a Cylinder primitive created along the Z axis with 8 sides and 4-6 segments. Move, scale and bevel the edges until you get a shape similar to what is in the concept art (**Fig.45**).

Fig 45



46. Unwrap the UVs for the weapon. Since we will use a separate texture it is better to spit the long weapon into a top and bottom half so both UV shells can fit into a square UV space for more optimal texture usage. I defined an inner edge and used Tools > UV > Unwrap Tool with a spherical projection, however you might find other projections work better for your model (**Fig.46**).

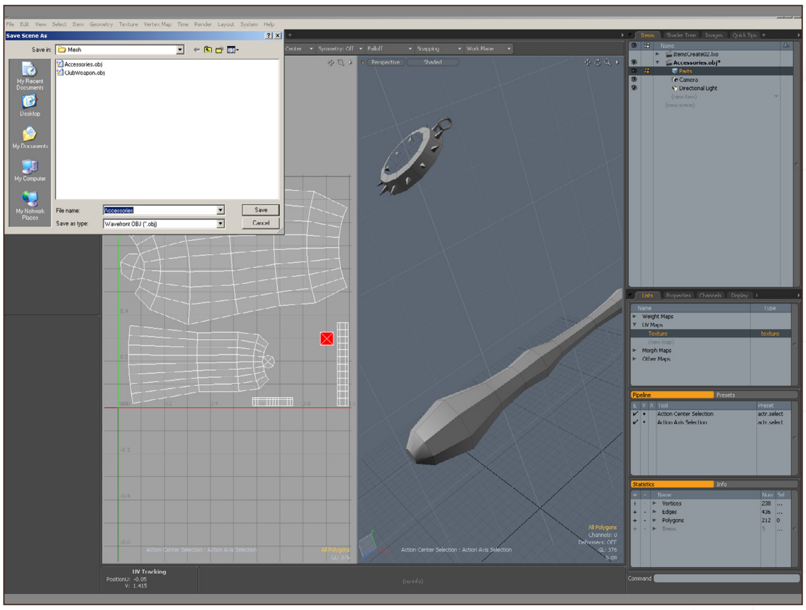
Fig 46



INTO ZBRUSH

47. That should be almost all the modeling we need to do for the shackles, chain and weapon. We will import the parts into ZBrush now and create a high poly version for the normal map. Export the objects as an OBJ in the same way as we have done before, and import it into ZBrush (**Fig.47**).

Fig 47



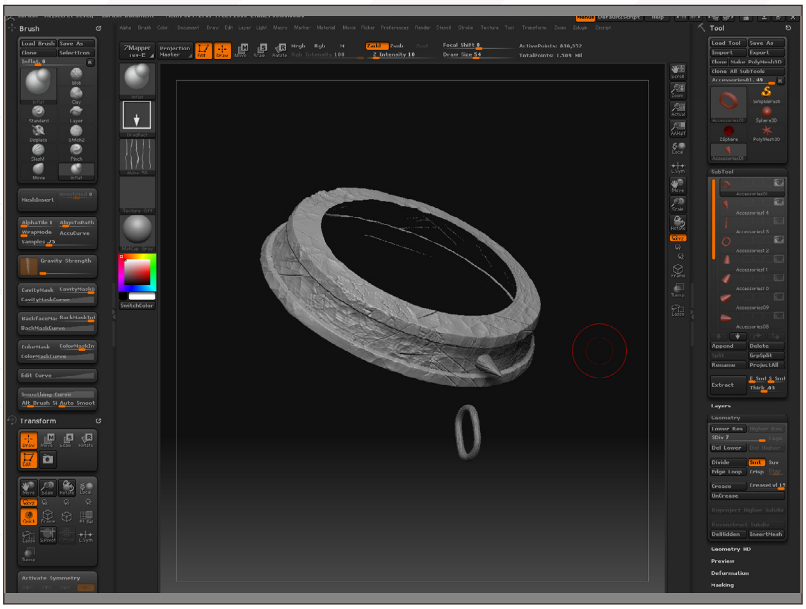


Fig 48

48. Using various Clay tools and alphas, add detail to the metal and wooden parts. Keeping in mind the materials each is made of, create a crude and weathered hammered look for the metal rings and chain links (**Fig.48**).

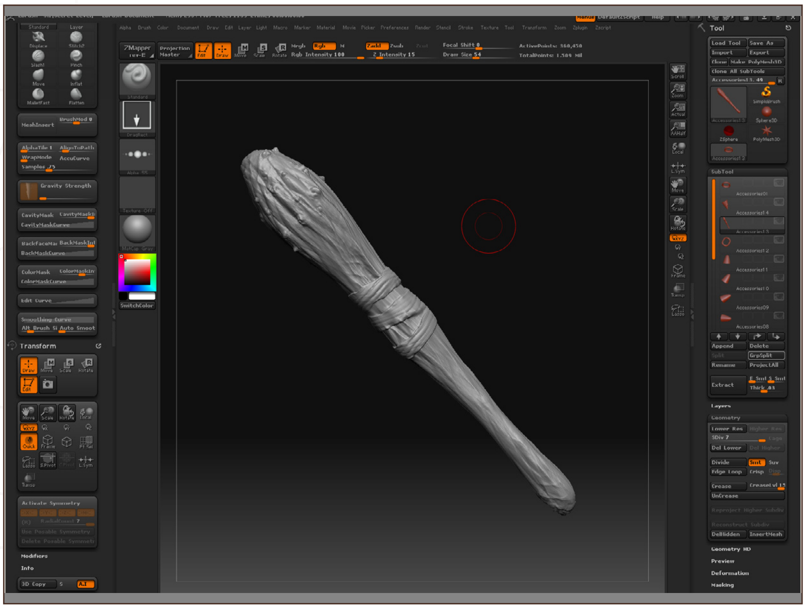


Fig 49

49. For the club you can imagine how, with primitive tools made from rocks, slate and other items found lying around, carving anything beautiful from a big stick would be a challenge to say the least. Carve into the body of the club now, hollowing out some areas and adding a large indent where it's perhaps gotten caught or scratched (**Fig.49**).

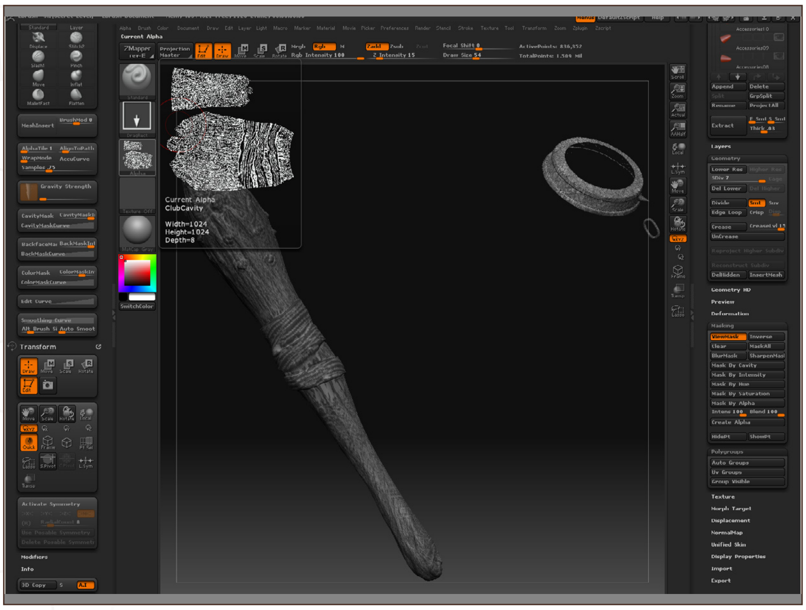


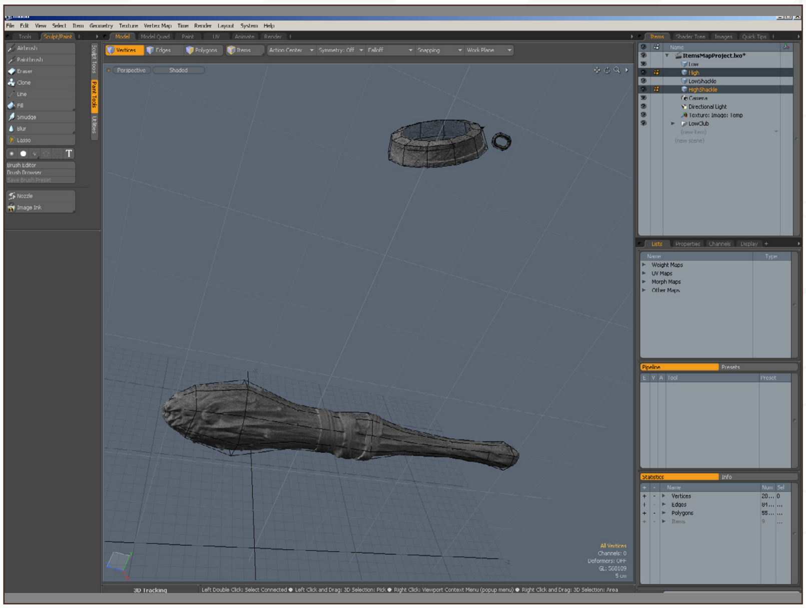
Fig 50

50. Once the sculpting is done, create a Cavity Map for the parts and save out the images to be edited later. Next re-export the base mesh and each high-res mesh as OBJs to be used in modo using the same steps we used in Chapter 5, steps 6-15 (**Fig.50**).

Back into modo

51. Back in modo now. Since the objects UVs are already unwrapped we can proceed with projecting our AO and Normal maps. Import in both high- and low-res OBJs and use steps 6-12 from Chapter 5 of this series (**Fig.51**).

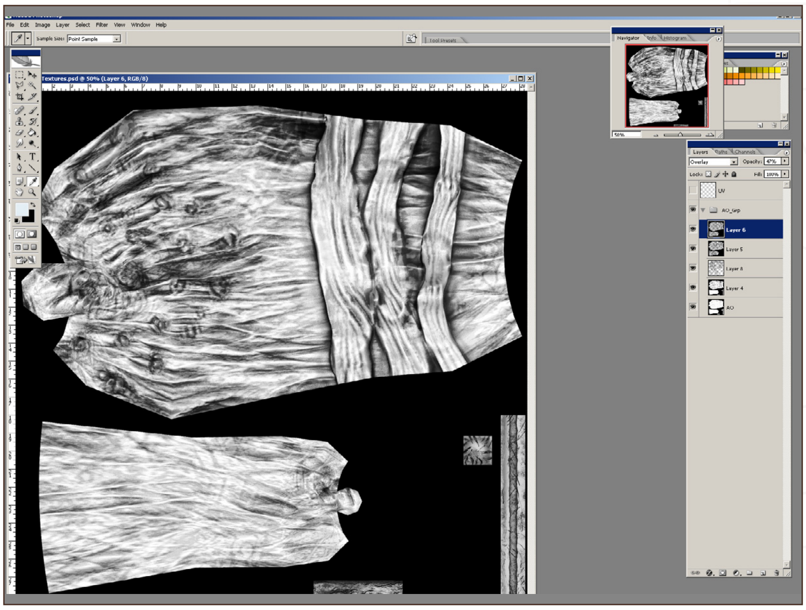
Fig 51



Into Photoshop

52. One we have the maps rendered, edit and clean them up in Photoshop using steps 13-20 in Chapter 5 of this series. They could then be combined with our existing textures since we made sure that the objects' UVs in empty areas, or in the case of the club, used a completely new map set. However, since the UVs are not overlapping on the new textures I decided to keep them together on a separate map (**Fig.52**).

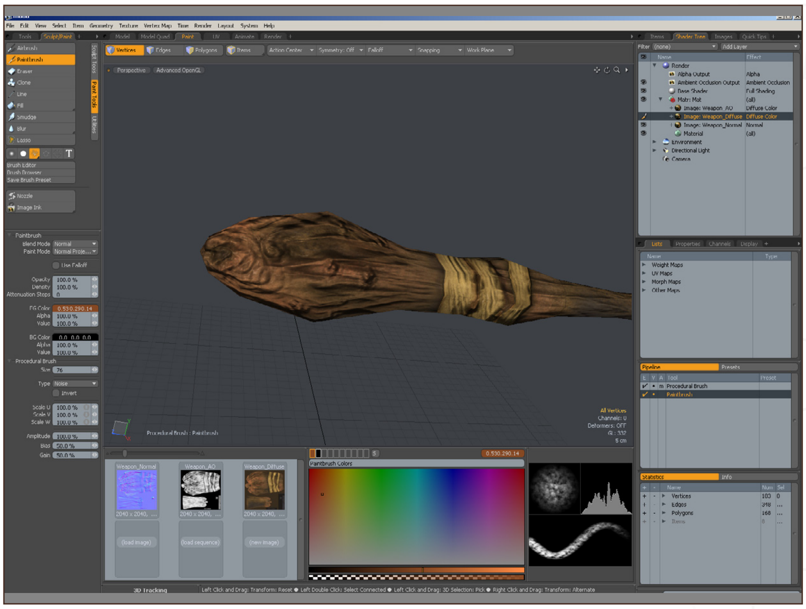
Fig 52



Back into modo

53. We will use modo's 3D paint ability to quickly add color onto the diffuse maps for the metal and weapon, as we did in step 22 of Chapter 5. Then import the new diffuse into Photoshop for final editing (**Fig.53**).

Fig 53



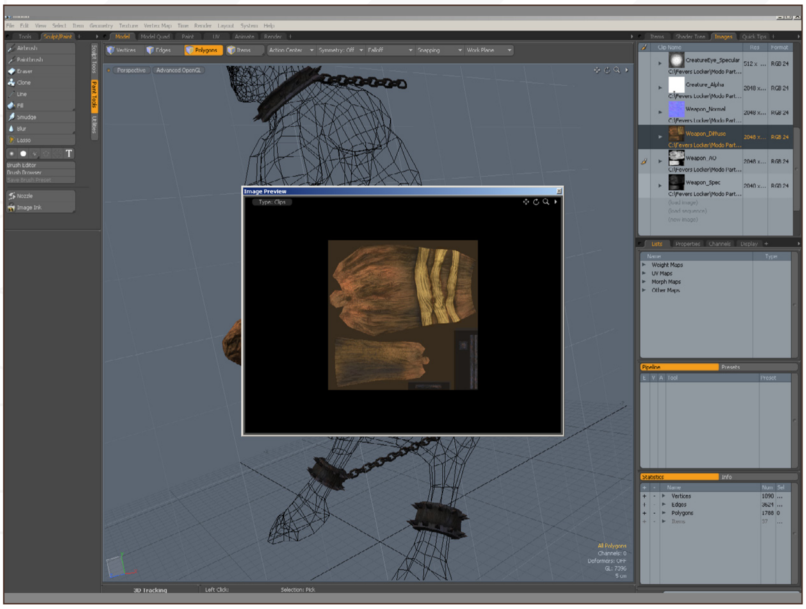


Fig 54

54. When it's complete, save the weapon textures as "Weapon_Diffuse", "Weapon_AO", "Weapon_Normal" and "Weapon_Specular", then load them into modo (**Fig.54**).

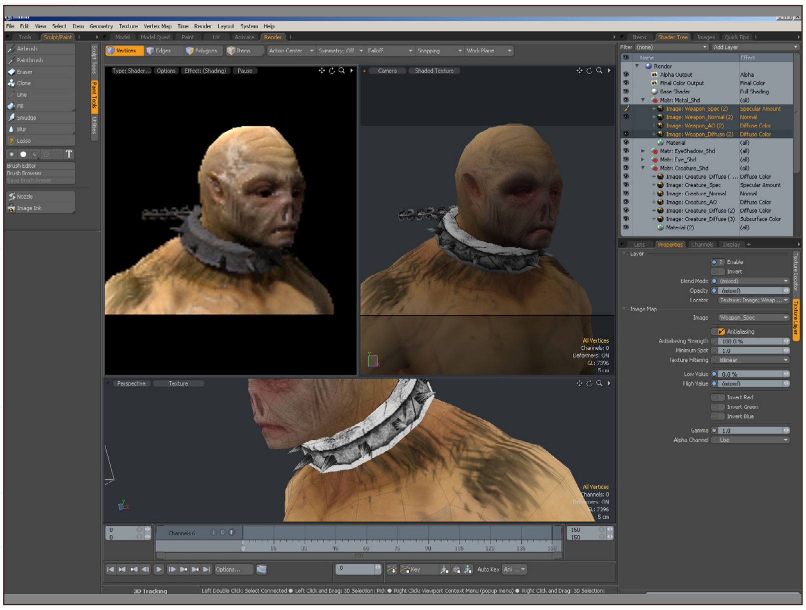


Fig 55

55. We will create a new Metal shader for the metal parts and a wooden shader for the weapon. Starting with metal, assign a shader called "Metal_Shd". Since we will be recycling the newly updated character textures, we can make a copy of the Create Diffuse, AO, Normal, and Specular layers over into the new Metal_ Shd group. This is much quicker than simply re-building the shaders and is good practice (**Fig.55**).

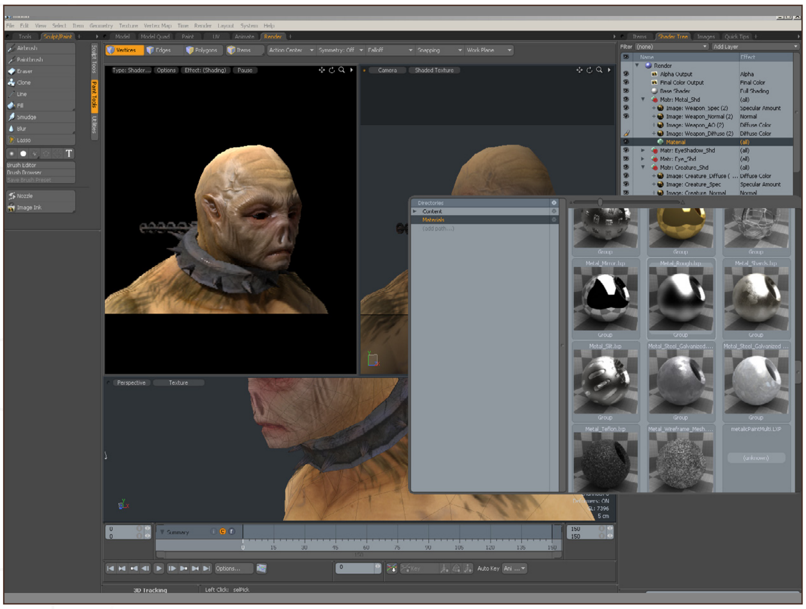
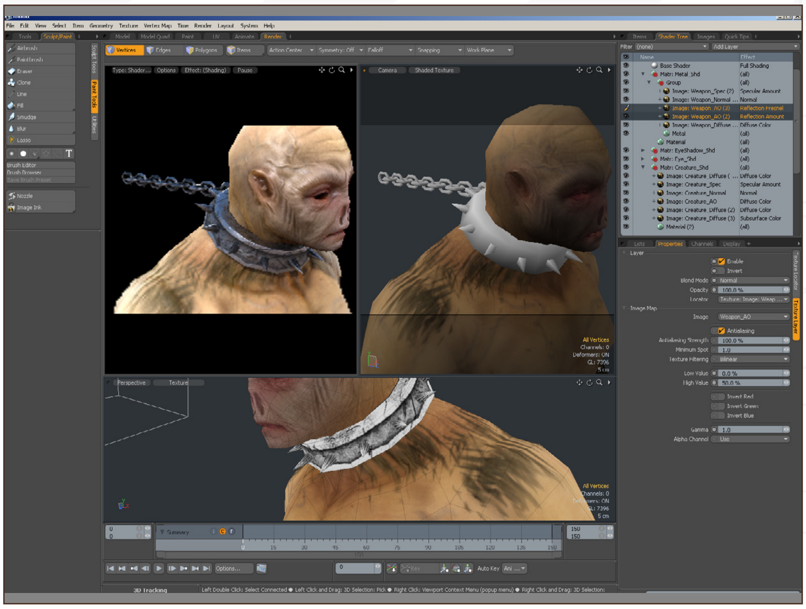


Fig 56

56. Next we will set up the Metal_Shd material to give it a more metallic look. The important aspects of metal are the specular, which is usually tinted the same color as the metal, and that it tends to be reflective and have a high fresnel value. We could set the initial values, however modo comes with several preset materials that are helpful for quickly setting up materials that we can modify to our needs. In the Shader Tree, right click on the base material for Mtr: Metal_Shd and select Load Preset. In the pop up window in the materials directory select Metal_Rough.lxp (**Fig.56**).

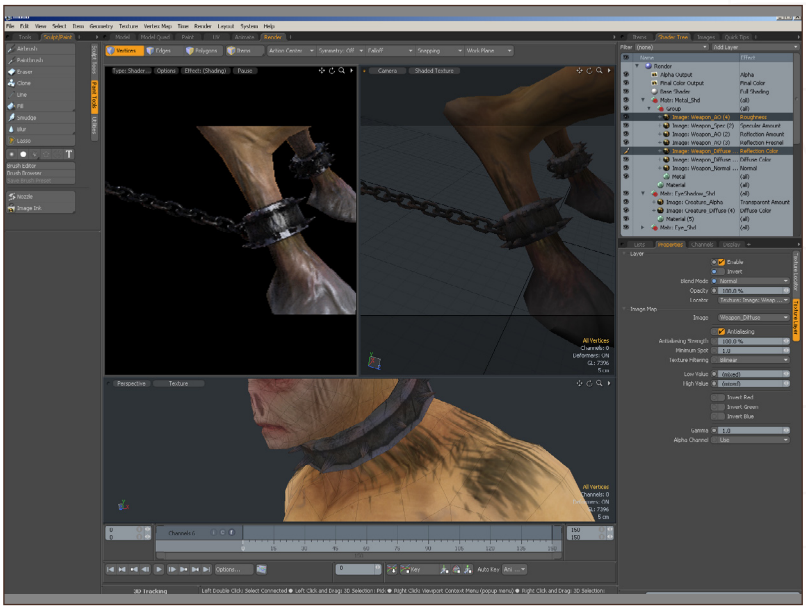
57. Within the new Group directory located above the new metal shader, set up Image Map layers for Diffuse, Normal and Specular as we did in **Fig.16 – 19**. For the metal we will use the AO to control the Roughness and Reflection, and Diffuse to control the reflection color. First set up a Image Map layer and set its effect to Reflection amount, then adjust the high and low values to Low 0% and High 50%. Then duplicate the Image layer and change its effect to Reflection Fresnel (**Fig.57**).

Fig 57



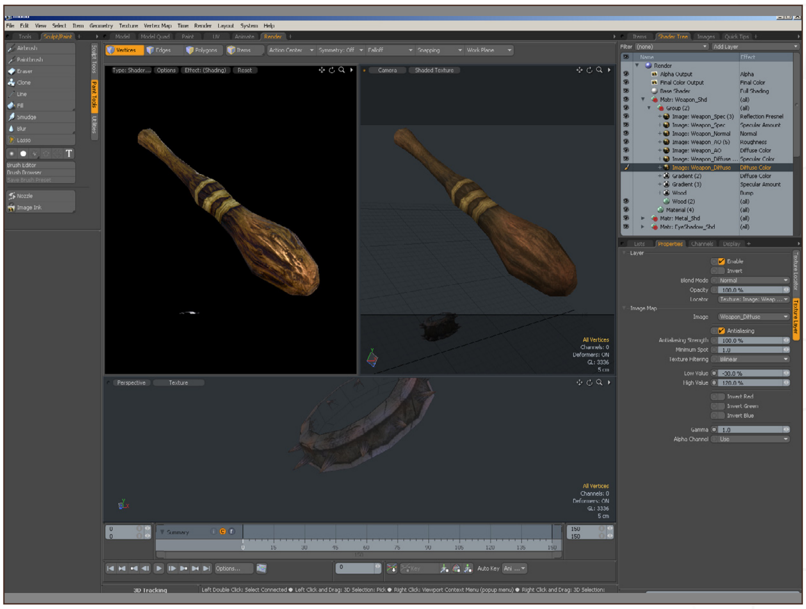
58. Next, duplicate the Diffuse layer and set its reflection color and adjust the high and low values to Low -30, High 150%. Then set up a Image Map layer, set its effect to Roughness amount and adjust the high and low values to Low 50, High 100% (**Fig.58**).

Fig 58



59. Finally let's create a shader for the weapon called "Weapon_Mtr" then add the modo Preset Wood_Matte.lxp. This material will load with two gradients and a bump map that will not be using right now, so turn off their visibility, then add the Weapon_Diffuse, Normal, Spec and AO that we created earlier. Duplicate and adjust the various layers until you get a result you are satisfied with (**Fig.59**).

Fig 59



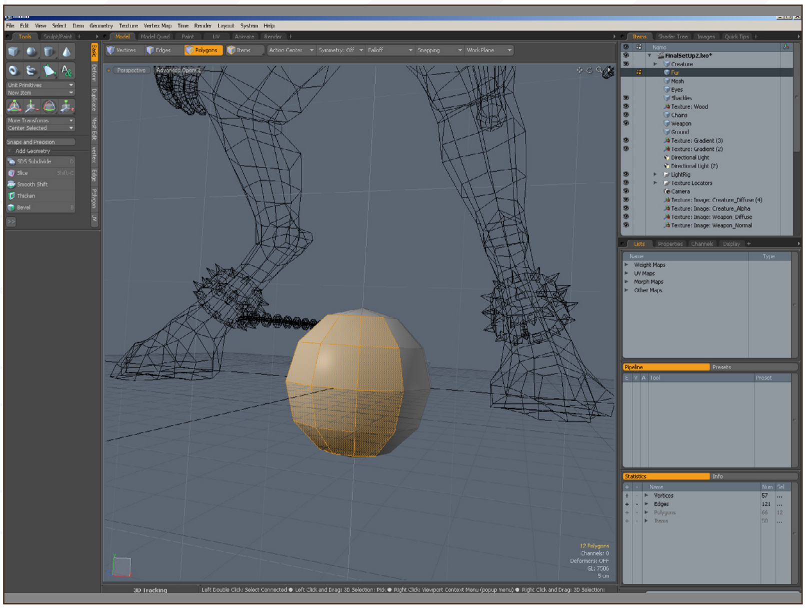


Fig 60

60. Fur in video games has always been notoriously hard due to its somewhat fluid, transparent and organic look, which can be difficult to simulate using polygons and texture pixels. The basic methods to create fur in modo for realtime is with alpha-mapped polygon planes or actual geometry. Since most game engines are able to process more polygons than textures we will use the polygons for the fur shape and recycle a special image map that is fast to process for the fur strands. In a new mesh layer start with a Sphere Primitive that has 11 sides and 6 Segments along the Y axis, then delete all the faces except the front 12 (**Fig.60**).

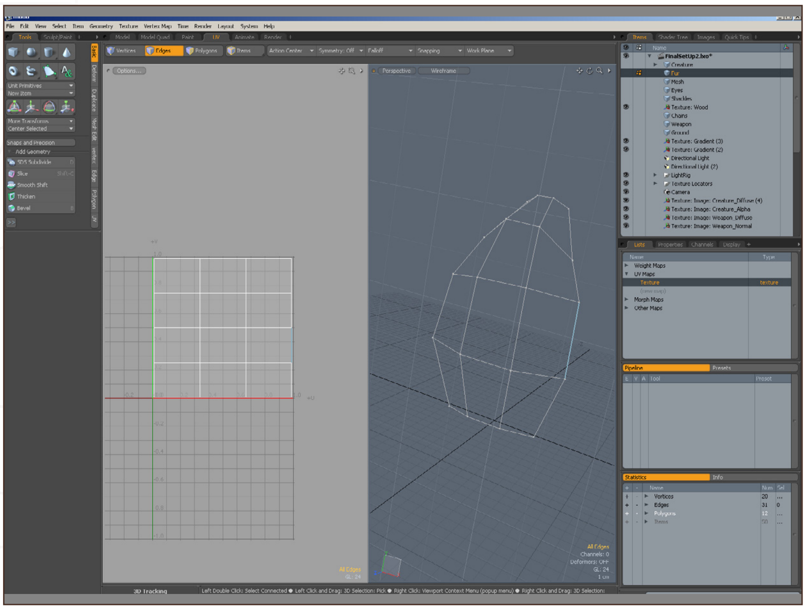


Fig 61

61. Now shape the mesh into a "leaf shape" as this will be our basic hair clump shape. Note that it is helpful to look at how the fur is drawn in the concept to get a shape that matches. Next lay out the UVs as shown; the fur root and tip edges are horizontal (**Fig.61**).

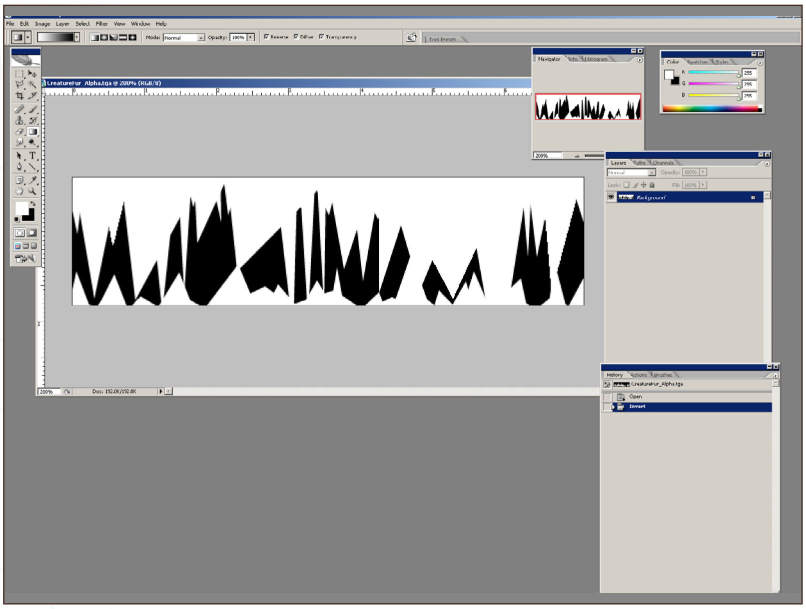
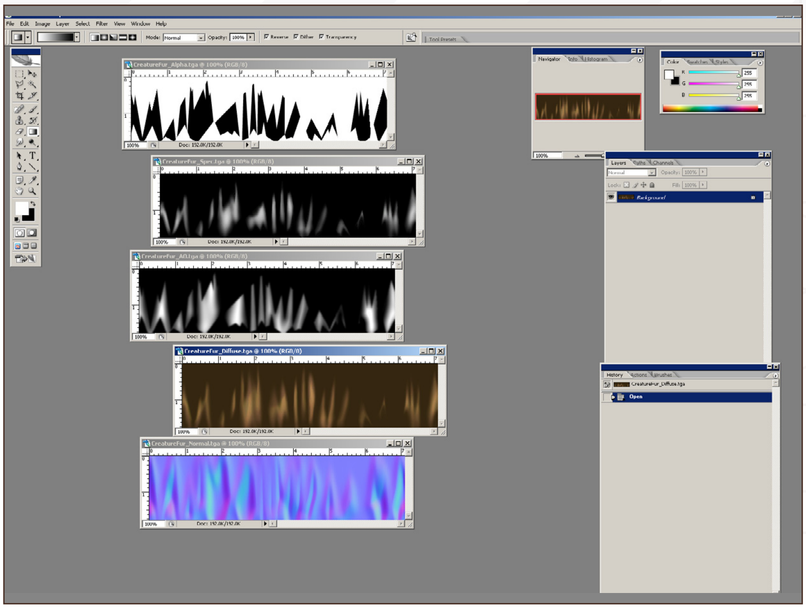


Fig 62

62. We will need the fur texture layers ready and applied to the polygon plane when we duplicate and position the fur parts into place on the model, as seeing the textures will help visualize how it should look. In Photoshop, create a texture that is 512 pixels wide x 128 pixels high (**Fig.62**). We will use a 1 bit alpha to simulate strands and having a very wide image will reduce the effect of bitmapping, since we will compress the UVs on the U axis.

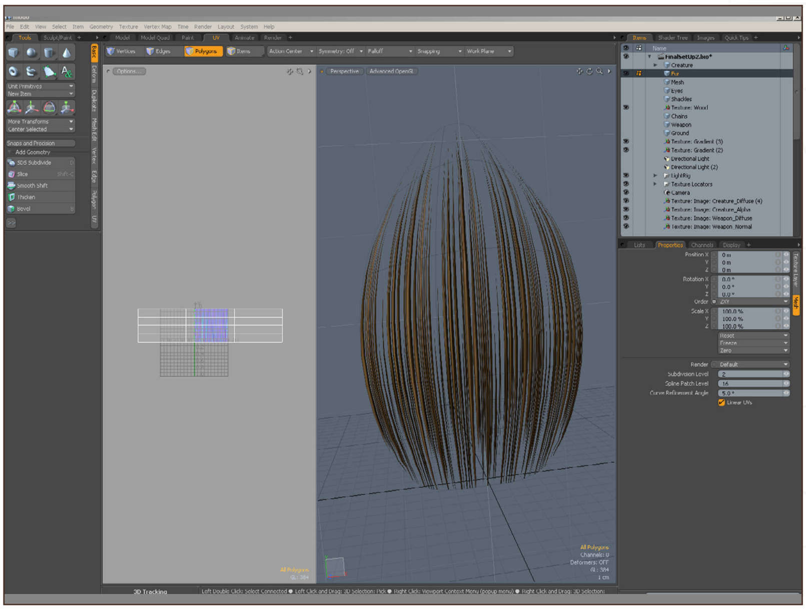
63, Use the black and white image to make your Diffuse, AO, Specular, and Normal maps. Name the maps: “CreatureFur_Diffuse”, “CreatureFur_AO”, “CreatureFur_Specular”, and “CreatureFur_Normal” (**Fig.63**).

Fig 63



64. Apply a new shader, Fur_SHD, and import and assign the new fur textures to the shader. Special tip: Use a Transparent amount to see your alpha in Open GL, but to help speed up your renders change the alpha setting to Stencil. Once applied, scale the UVs to get the texture to tile horizontally across the petal, making more, and thinner hair. To help the hair look better, turn on the poly sub-d and make sure Linear UVs and Double Sided are active in the Mesh Properties menu (**Fig.64**).

Fig 64



65. We will use modo’s Mesh Paint and Instance functions to quickly add the fur to the model surface. We need to make sure the Fur Mesh is positioned at 0,0,0 in the scene space and scaled to a reasonable size. Also make sure the mesh is pointing up in positive Y. Finally, make sure the mesh pivot (0,0,0) is at its base when in Item Mode (**Fig.65**).

Fig 65

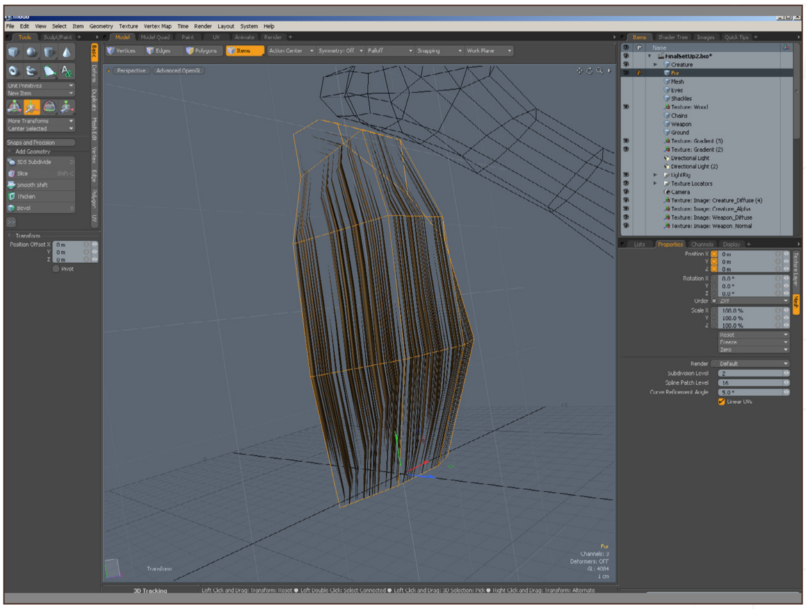


Fig 66

66. With only the Creature Body layer active and the Fur Mesh layer visible, but not active, go to Tools > Duplicate > Mesh Paint. Enter the following settings: Geometry Source: All BG Layers; Paint Mode: Slide; Create Instances: active; Size Mode: Uniform; Rotation Mode: Adaptive, and Size: 10. Then start adding the fur petals to the arms, legs and where ever else the fur might be. Don't worry about their alignment just as long as they on or near the model surface and rotated away from it. I created about 30 petals for each limb for good coverage, and added a few to other parts of the body to help add to the effect of a fur-covered body (**Fig.66**).

Fig 67

67. When complete, go into Item mode and rotate, scale and position each instance so that they flow together in a natural direction. Try to maintain their alignment with each other as much as possible since fur tends to flow with itself. After finishing your positioning you can go back to the original hair petal and adjust the UVs so the fur is thicker or thinner to more closely match the concept art, since the petals are instances and will be updated by the original mesh (**Fig.67**).

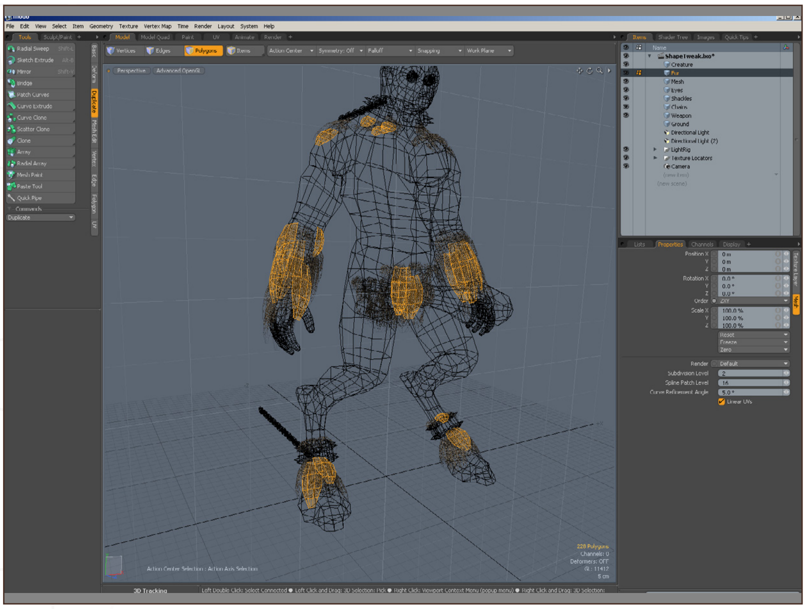


Fig 68

68. When satisfied with the your edits, Select all the instanced petals, convert them to polygons, and then cut and paste them all into their own layer. Congratulations you just made a efficient real-time capable and reasonably convincing looking fur (**Fig.68**)!

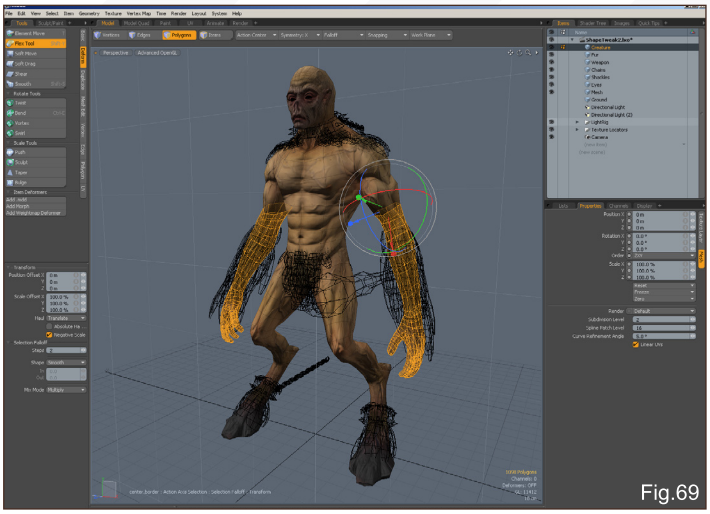


Fig.69

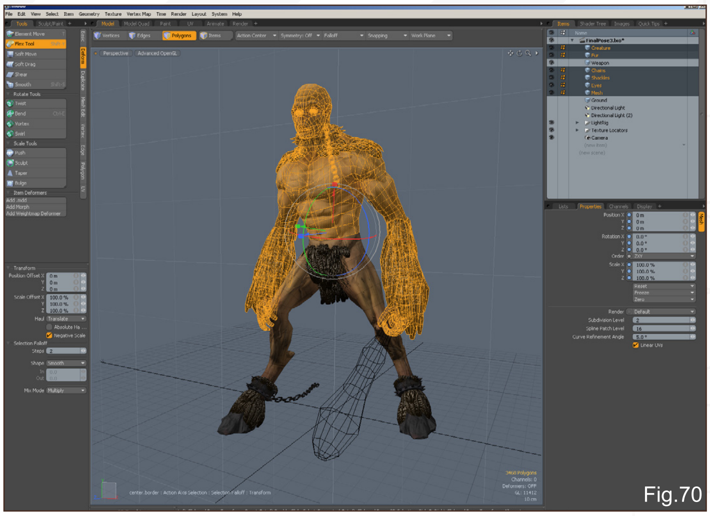


Fig.70

69. All parts of our character are now complete. If at this stage you are not satisfied with the final result compared with the original concept, now is good time to make a few tweaks to help bring the character closer in feeling to the original art. Using modo's Sculpt tools I adjusted the proportions of the body to make the creature a bit more slender in the legs and hips, elongated the forearms slightly and lowered the jaw slightly (**Fig.69**).

70. The character is now fully complete and ready for rigging to be animated or simply posing. For the final renders, I wanted a pose that more closely matched the concept art, and I used modo's Deform tools such as the Flex Tool for get a more natural pose (**Fig.70**).

In-Game

Our character may look complete, but this is a model designed for a game engine and will look even better when running around lit by multiple light sources, self shadowing, and with correct hair shading. It's important to remember that the way it looks in modo isn't always the way it will look in-game. If at all possible, try to get the character in-game early on, and keep testing all throughout the process to save time at the end. The difference between in-modo and in-game is illustrated in **Fig.71a & b**. **Fig.71a** is the modo render, and **Fig.71b** is the same setup mocked up in a real time game engine.


Fig.71a


Fig.71b

Conclusion

Congratulations on creating your character up to this point! It's been a long process and we have learnt a whole lot along the way. The games industry is very wide ranging and you might be expected to do all of these steps when building a character, unlike the film industry where you might be responsible for only one or two of these many steps. Creating textures, shaders, modeling and sculpting are all integral parts of a realtime artist's job, and experience with and knowledge of the entire character creation process goes hand in hand with the skills necessary to becoming a great artist. I hope this tutorial has given you a good starting ground for now going off and bringing your own characters to life!

Creature Concept by: Richard Tilbury
Tutorial originally created by Joseph Harford in ZBrush & 3ds Max; translated by John Hayes for modo

Tutorial by:
JOHN HAYES
For more from this artist visit:
http://zugok.cgsociety.org/
Or contact them: zugok@sbcglobal.net

DOWNLOAD RESOURCES
- FREE LOW POLY MODEL & TEXTURES